RAVENSWOOD
ALUMINUM CORPORATION

P.O. Box 98
Ravenswood, WV 26164
304-273-6300

December 11, 1996

Mr. Michael A. Jacobi (3HW61)
RCRA Enforcement Section
US EPA - Region III
841 Chestnut Street
Philadelphia, Pennsylvania 19107-4431

Subject: Response to request of July 23, 1996 for changes to the Description of Current Conditions

Dear Mr. Jacobi:

Ravenswood Aluminum Corporation is submitting the information you requested in your July 23, 1996 and Oct. 17, 1996 correspondences. I believe that changes suggested during our conversations of Nov. 6 - 8, EPA site visit to Ravenswood, have been addressed. I also hope to take time to review major changes during our visit to your office in Philadelphia on Dec. 16 - 17, 1996.

If you have any questions, please call me at (304) 273-6280.

Sincerely,

RAVENSWOOD ALUMINUM CORPORATION

Richard Thomas
Environmental Engineer

enclosure
cc: Bill Vinzant, KACC
Michael Henson, PhD, RMT

Attachment A
Ravenswood Aluminum Corporation
Description of Current Conditions Report

Page Replacement Instructions:

- Replace cover page
- Replace table of contents
- Section 2 - Replace text and tables from page 2-5 to end
- Replace Figures 2 - 2a & 2b
- Remove Figure 2-9
- Replace Figure 2-10 with new Figure 2-9
- Replace pages 3-3 and 3-4 in Section 3
- Section 3 - Replace text and tables from page 3-6 to end
- Replace pages 4-6, 4-8, 4-14, and 1-15 in Section 4
- Replace Table 4-1
- Replace Figure 8-1
- Replace pages 9-15 and 9-16 in Section 9
- Replace Section 10
- Replace page 18-3 in Section 18
- Section 19 - Replace text and tables from page 19-2 to end
- Replace page 20-3 in Section 20
- Replace page 22-2 in Section 22
- Section 22 - Replace text and tables from page 22-5 to end
- Section 23 - Replace text and tables from page 23-2 to end
- Section 23 - Replace Figures 23-1a and 23-1b with Figures 23-1a through 23-1f
- Replace pages 24-2 and 24-3 in Section 24
- Replace Table 24-1
- Replace Section 25

Plates:

- Attach List of Property Owners to Plate 1A
- Replace Plate 2.
- Add Plate 10.
- Add Plate 11.
- Add Plate 12.

Appendices:

- Add Sediment Analyses and Wetlands Inventory Map to Appendix A

April 17, 1996

Mr. Michael A. Jacobi (3HW61)
United States Environmental Protection Agency
Region III
841 Chestnut Street
Philadelphia, Pennsylvania 19107

Subject: Ravenswood Aluminum Corporation
Administrative Consent Order
EPA Docket No. RCRA-III-069-CA
Revisions to Description of Current Conditions

Dear Mike:

Attached are four copies of the revisions to the Description of Current Conditions (DCC) report as required by the Administrative Consent Order. To facilitate replacement, we have provided a reprint of all pages; therefore, the pages of the report that was provided to you in February 1995 can be completely replaced with the attached report pages. The appendices have several additions that are so noted. Also provided are replacement cover inserts for the report. The Pre-Investigation Evaluation of Corrective Measure Technologies report is not being revised at this time. Additional copies of the DCC report have been forwarded to the below named persons.

Thank you for your efforts in the preparation of this document. If you have any questions, please call me at (864) 234-9309.

Sincerely,

J. Michael Henson

J. Michael Henson, Ph.D.
Project Manager

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cc: Gail Graban, Ravenswood Aluminum Corporation
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70410.21 File

RMT INC.

RMT, INC. — GREENVILLE, SC
100 VERDAE BOULEVARD • 29607-3825
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DESCRIPTION OF CURRENT CONDITIONS REPORT

Ravenswood Aluminum Corporation
Ravenswood, West Virginia

December 1996

Report by:
MALCOLM PIRNIE, INC.

Revised by:
RMT, INC.
100 Verdae Boulevard
Greenville, South Carolina 29607

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1.0 INTRODUCTION

In 1954, Kaiser Aluminum & Chemical Corporation (KACC) began construction of the aluminum reduction and fabrication facility located just outside of Ravenswood, West Virginia. The first fabrication operations began in 1957, and the first molten metal was cast in 1958. The fully integrated aluminum facility is composed of two plants: a Reduction Plant and a Fabrication Plant (sheet, plate, and coil mill). On December 9, 1988, KACC signed an asset purchase agreement with Ravenswood Aluminum Corporation (RAC) to transfer ownership of certain assets to RAC, including most of the reduction and fabrication operations at the facility. On January 5, 1989, KACC revised the facility Part A Application to transfer interim status to RAC. Sale of the facility to RAC was finalized on February, 7, 1989. The facility is shown on Plate 1.

RAC is the largest private company in Jackson County and the fourth largest manufacturing employer in West Virginia. RAC is a major supplier of aluminum plates to satisfy the exacting requirements of the aircraft, aerospace, and defense industries. RAC is also a major supplier of aluminum for the railcar, automobile, construction, lighting, truck trailer, and beverage industries. RAC generates a variety of aluminum materials, including plates ranging from 8 to 10 inches, sheets with thicknesses of approximately 0.25 inches, and coil with thicknesses as small as 0.025 inches.

1.1 PURPOSE

RAC and the United States Environmental Protection Agency (US EPA) Region III have entered into a Resource Conservation and Recovery Act (RCRA) Section 3008(h) Order on Consent (Docket No. RCRA-III-069-CA). RAC received a fully executed, true, and exact copy of this Consent Order on October 6, 1994. The Consent Order requires that RAC perform activities associated with a RCRA Facility Investigation (RFI). As part of the RFI process, RAC is required to prepare a Description of Current Conditions (DCC) Report, providing information pertinent to hazardous constituents and solid waste management at the facility. Pursuant to the Consent Order, this DCC Report must be submitted to US EPA within 120 days of the effective date of the Consent Order (*i.e.*, February 4, 1995).

1.2 ORGANIZATION

This document is divided into 24 major sections. Section 1.0 presents an introduction to the DCC Report. Section 2.0 presents a summary of the facility background, including information on the facility history; location; surrounding land use; operations and waste management practices; permits, enforcement actions, and responses; and past spills. Section 2.0 also presents a list of the areas addressed in the DCC Report. Section 3.0 details the site and area geology and hydrogeology.

Section 4.0 discusses the Areas of Former Potliner Management at the facility. Sections 5.0 through 21.0 discuss each of the areas listed as solid waste management units (SWMUs) in the 1986 Interim RCRA Facility Assessment (RFA) Report by NUS (US EPA Contractor) and/or the 1988 Report by Versar (US EPA Contractor). These areas are identified on Plate 2. Each section includes the following, as appropriate:

- A description and location of the unit or area,
- A summary of the construction of the unit or area,
- A summary of the operation of the unit or area,
- A list of possible hazardous constituents associated with the unit or area, and
- An explanation of possible migration pathways for hazardous constituents from the unit or area.

These sections also include discussions of the results of soil investigations in the areas or at the units, a summary of the ongoing groundwater monitoring in the area, and assessments of further investigation needs.

Section 22.0 presents information on other areas noted during site visits or during the review of information on plant operations or investigations. These areas are also identified on Plate 2.

Section 23.0 presents the results of previous investigations relative to groundwater at the site and assesses the need for further groundwater sampling. The groundwater at the facility is grouped into six main areas:

- Groundwater Underlying the Areas of Former Potliner Management;
- Groundwater Underlying the Oil Recovery Ponds;
- Groundwater Underlying the Industrial Landfill (closed in 1992);

- Groundwater Underlying the Old Landfill;
- Groundwater Underlying the Sprayfield; and
- Groundwater Underlying the Outfall 001 Conveyance.

Section 24.0 presents a summary of the DCC Report and proposed sampling.

1.3 SOURCES

The information presented in this DCC Report was gathered from numerous sources, including but not limited to the following:

- Permit applications and permits;
- Site hydrogeologic investigations;
- Groundwater and soil monitoring results;
- RCRA Facility Assessments performed by US EPA's contractors;
- RAC, KACC, and US EPA files;
- Discussions with current and former plant personnel;
- Various other reports;
- Site visits and visual observations; and
- Aerial photographs.

The sources are referenced throughout the text as appropriate and are listed in Section 25.0 of this DCC Report.

2.0 FACILITY BACKGROUND

2.1 HISTORY

As stated in Section 1.0, the fully integrated aluminum producing facility consists of two plants: a Reduction Plant and a Fabrication Plant. The Reduction Plant converts alumina into molten aluminum. The molten aluminum is then cast into ingots in the Cast House. The Fabrication Plant rolls the aluminum ingots into plates, sheets, and coils. This was the first facility in the industry to include reduction and rolling operations at a single location. The facility was built at a cost of $21.3 million and would cost over $2 billion to build today.

KACC purchased the property that currently comprises the facility in the early 1950s. Major structures at the facility, including the Reduction Plant, Cast House, Fabrication Plant, administrative offices, and rectifier station, are shown on Plate 1. A list of significant events in the history of the facility is presented in Table 2-1.

2.2 LOCATION

The facility is located on a 2,600-acre site within the Ohio River Valley in Jackson County, West Virginia. The plant site is located approximately 3.2 miles downstream (southwest) of the City of Ravenswood, as shown in the United States Geological Survey (USGS) map in Appendix A.

The industrial property is located entirely within Ravenswood Bottom, which is a sickle-shaped bottom land alluvial deposit situated along the inside of a sharp meander (bend) of the Ohio River. Ravenswood Bottom is approximately 4 miles in length and, at its widest is approximately 1 mile across. The relatively flat bottomland of Ravenswood Bottom (elevation ranging from 570 to 630 feet above mean sea level (msl)) is bounded to the east by the valley wall that ascends to an elevation of more than 800 feet msl over a distance of less than 1 mile. Plate 1 shows topography in the plant site area. These upland areas can be rugged and are characterized by steep slopes and strong relief. Stream erosion and transport, in conjunction with weathering and mass-wasting of slope materials, are largely responsible for the existing topographic expression of the upland areas (Price, *Geology*).

2.3 SURROUNDING LAND USE

The industrial area of the facility consists of approximately 300 acres of land, while the total property consists of approximately 2,600 acres, resulting in a buffer zone that isolates the industrial facility. Plate 1A shows the property boundary and identifies all adjoining property owners. Figure 2-1 illustrates the various uses of the land surrounding the facility. The nearest residences are located in the hills approximately .75 miles east of industrial operations. These residences are served by a public water supply or pump their groundwater from an aquifer that does not underlay the facility. If any water wells exist in this residential area, they would be drilled into the bedrock of the hills to the east, which are hydraulically upgradient of the industrial facility. The nearest residences to the south of the plant are in the community of Millwood, about 1.5 miles south of the area of the closed on-site landfill. These residences get their water from the Cottageville Public Water Supply System. The Jackson County Industrial Park is located along the southwest corner of the facility property. The industrial park also gets its water from the Cottageville system. The City of Ravenswood is more than 3 miles upriver (5 miles by road) of the facility. Point Pleasant, the nearest major downstream community, is greater than 25 miles down river from the plant. Both of these communities, as well as a number of other smaller communities located between the facility and Point Pleasant, are hydraulically isolated from the plant. The nearest down river public water supply intake from the Ohio River is at the city of Huntington, West Virginia (located approximately 70 miles down river from the facility where the West Virginia, Kentucky, and Ohio borders meet).

2.4 FACILITY OPERATIONS

The Ravenswood Aluminum Corporation facility is divided into two plants, Reduction and Fabrication. The Reduction Plant produces molten prime aluminum, which is cast into 5- to 25-ton ingots of various aluminum alloys for the rolling mills in the Fabrication Plant. The Fabrication Plant produces finished sheet, plate, and coil. The following narrative is a brief summary of the production processes that occur at the Ravenswood facility. Figure 2-2 is a plan view of the production area of the Ravenswood facility showing some of the locations discussed in this section. Figure 2-3 provides a block flow diagram of operations at the Ravenswood facility.

Alumina (aluminum oxide ore) is transported from the Gulf Coast in barges up the Mississippi and Ohio Rivers to the facility. Alumina is moved into the Reduction Plant by a series of covered conveyors and storage silos. Most incoming alumina is first used in the alumina scrubbers, which treat exhaust air from the potlines and the carbon baking furnaces. After it is removed from the scrubbers, the reacted alumina is placed into storage silos from which it is fed into hoppers located above each pot on the potlines.

The facility operates four potlines. Each Potline consists of 168 pots, or electrolytic cells. On each potline, two groups of 84 pots are connected in series to electricity at approximately 765 volts DC and 93,000 amperes. The pots consist of steel shells with a cathode lining composed of pre-baked carbon cathode blocks. A brick layer provides thermal insulation between the carbon cathode and the steel shell of the pot. Large steel bars embedded in the bottom portion of the cathode lining serve as cathode current collectors. These collector bars extend out through openings in the shell to connect to the cathode bus. The anodes are blocks of carbon connected to copper rods and suspended into the pots from above. A bath of molten alumina and cryolite (sodium aluminum fluoride) separates the cathodes and anodes. The electrical current through the cryolite electrolyte promotes the following chemical reaction between the alumina and the consumable anode:

$$2Al_2O_3 + 3C \rightarrow 4Al + 3CO_2$$

The molten metallic aluminum deposits on the cathode and is siphoned out of each pot into a crucible on a daily basis.

Carbon anodes are produced at the facility's Carbon Plant by combining coke and pitch, pressing it into finished carbon blocks, and baking these anodes in ring furnaces. The rodding department at the facility receives the baked anodes and connects them to copper rod assemblies. The rodded anodes are suspended by the rodded assemblies from a superstructure extending over the pot so that their vertical position can be adjusted as the anodes are consumed. Anode blocks are consumed at a rate of approximately 0.5 kilogram of carbon per kilogram of aluminum produced.

The reduction process in each pot is monitored by a microprocessor, which is linked to a central computer system. This system allows potroom workers to monitor the flow of materials and energy and provides computer generated voice alerts if any irregularities occur. Gaseous emissions from the potline reduction cells are cleaned by scrubbing. The gasses are collected and passed through a fluidized-bed dry alumina scrubber before release to the atmosphere.

Molten aluminum from the potlines is transported to the Cast House in crucibles. The molten metal is poured into one of ten melting furnaces where it is mixed with recyclable scrap and alloying agents. After the desired alloy is obtained, the molten metal is transferred to adjacent holding furnaces. After fluxing and filtering to assure product quality, the molten metal is poured into water-cooled molds for direct-chill casting of ingots up to 300 inches long and weighing from 5 to 25 tons. Ingots from the Cast House are transferred to the Fabrication Plant, which can produce plate, sheet, or coil aluminum.

After casting, the rough finish of the ingot is removed by "scalping" both wide sides in preparation for rolling. Following scalping, ingots are reheated to rolling temperatures in the walking beam furnace or in an insulated soaking pit.

Heated ingots are lowered into the entry end of the hotline and conveyed to the 168-inch breakdown mill. If the ingot is to become plate, it is processed through the 168-inch breakdown mill before going to the plate department for additional processing. If the ingot is to be rolled into sheet or coil, it moves from the 168-inch breakdown mill to the 110-inch hot mill and finally to the five-stand hot mill. The resulting coils can go to cold milling for additional processing or can be sold to customers who have cold-rolling capability.

The facility contains the world's largest plate stretcher. Plates are normally stretched to flatten them, but certain alloys are stretched to relieve rolling stress in the metal. After stretching, the plate can be heat-treated to achieve maximum strength and formability. The facility also contains the largest cold mill in North America, which has the capability to produce precision coils and sheets up to 103 inches wide and one-quarter inch thick.

Finishing of the aluminum is also performed at the facility. Two leveling lines, one for heavy gauge sheet and one for light gauge sheet, enable Ravenswood to offer a full range of leveled products. A high speed slitter is used to cut the aluminum rolls. A highly automated packing line protects coils with a wrapping of polyethylene that provides a moisture barrier.

The Ravenswood facility previously included a foil operation and three paint lines referred to as coil coating. The foil operation differed from coil operations mainly in the size and gage (down to 0.00024 inch) of the aluminum produced. The coil coating lines, operated from 1960 through 1965, applied paint to finished aluminum plate.

2.5 FACILITY WASTE GENERATION

This section provides descriptions of facility production processes, including waste generation. While most operations at the RAC facility have been consistent over the years, some processes and waste management practices have varied, reflecting changes in technology and regulations. The descriptions in this section reflect current practices except where specifically noted. This section has been prepared with the best available information. It is as comprehensive as possible about normal waste generation and disposal. Known short-term or single-event deviations from routine management practices and waste streams with complex waste management histories are discussed in the section of the report specifically concerning that area. Table 2-2 summarizes typical waste generation and management from the various plant areas and processes at the RAC facility. The table includes both current and known past waste management. Block flow diagrams are provided that show the inputs and outputs of the production processes. The block flow diagrams indicate current conditions. Greater detail about past and current waste management for specific areas is provided in Sections 4 through 22 of this report. Specific management practices that are relevant to the possible release of hazardous wastes or hazardous constituents are discussed in more detail in the appropriate sections of the text.

2.5.1 Carbon Plant

The Carbon Plant is where anodes and cold paste used in construction of new potlinings are produced. Electrolytic production of a kilogram of aluminum requires approximately 0.5 kg of carbon. Each pot in the potlines contains 20 anode blocks, which are consumed and must be replaced after about 12 days residence time. Up to 1000 anodes are produced daily. Figure 2-4 is a block diagram of Carbon Plant processes.

Anodes are made of delayed coke, fluid coke, and solid pitch. Coke and solid pitch are received by railcar and dump trailer truck and are transported via covered conveyor to concrete storage silos. Solid pitch is received and used in pelletized form. The storage silos are equipped with baghouses. Inside the Carbon Plant, the anode ingredients are mixed, then pressed into "green" carbon blocks. Contact cooling water is applied to the green carbon blocks as the blocks emerge from the presses. The cooling water is recirculated via a cooling tower. The green carbon blocks are placed in ring furnaces for baking into finished anodes. Fluid coke (finely ground, flowable carbon) is placed around the green carbon blocks in the ring furnace. Fluid coke is reused within the ring furnaces. Natural gas fuels the ring furnaces. Gaseous emissions from the ring furnaces are passed through an alumina-contact dry scrubber before release to the atmosphere. Alumina from the scrubber is used in the potlines.

The finished anodes are sent to the rodding department where rod assemblies are attached to the anodes. Rod assemblies, which connect the anodes to the source of electricity and suspend the anodes in the pots, are made of copper and arrive at the facility prefabricated. A molten pig iron alloy is poured around thimbles on the rod assemblies to permanently attach them to the carbon blocks. Damaged rod assembly parts (rods, gussets, thimbles) are recycled as scrap.

Anodes are not completely consumed in the aluminum reduction process. The portion of the anode remaining when it must be replaced in the pot is called a "butt." In addition, some anodes become broken or damaged in the pots and must be removed prematurely. These are called burnoffs. Anode butts and burnoffs are crushed and recycled into the anode production process to the extent possible.

Dusts collected from baghouses and from sweeping up spillage in and around the Carbon Plant are returned to the process to the extent possible without sacrificing anode quality. Non-recycled baghouse dusts are collected in covered bins at the baghouses in the Carbon Plant and are sent to the on-site dust handling facility located in the southwestern portion of the facility for transport to an off-site landfill. The electric arc furnace used to melt pig iron and alloying metals also has a baghouse. The baghouse dust is disposed of as nonhazardous waste with the other dusts. Prior to 1992, waste dusts and sweepings were disposed of in the on-site landfill.

When the flues of the ring furnace require rebuilding, the removed refractory brick is used as roadbase material within the facility. Mixtures of fluid coke, broken brick, and broken anode pieces are sent through a vibratory separator. The fluid coke is reused in the ring furnaces, while the brick fragments and other debris are sent to an off-site landfill. Prior to 1992, brick fragments and other debris were sent to the on-site landfill. Used brick has been tested for hazardous characteristics and was found to be nonhazardous. A summary table of brick analysis results is included in Appendix A-4.

Hydraulic oil from the two green carbon presses drips into sumps cast into the floor of the concrete pits located in the basement below the presses. The used hydraulic oil is pumped through an underground line to two 500-gallon steel tanks located within concrete containment structures at the Carbon Plant. The sumps are checked daily for the presence of oil. The pump is operated manually when oil is present. A vacuum truck removes the used hydraulic oil from the used oil tanks and sends it to an off-site recycler. The oil may sometimes be recycled on-site by transferring it to the sump at the Tank Farm where it is mixed with recovered oil from the Oil Recovery Ponds for use as a boiler fuel. Previously, this oil was sent to the Oil Recovery Ponds. The oil recovery system is described in Section 2.5.4, and used oil management units are described in more detail in Section 22.4.

When pots are rebuilt, prebaked cathode blocks are used. These prebaked cathodes are delivered to the pot repair area already attached to collector bars with pig iron. Cold paste is rammed into the spaces between the prebaked cathode blocks in the pot, and between the blocks and the insulator brick in the sides of the pot. Cold paste is made of coal, coke, and liquid pitch. Liquid pitch is received and stored in rail tanker cars. Steam is used to heat the liquid pitch to a pumpable consistency. When cold paste is being made, the liquid pitch is circulated through steam-jacketed piping from the storage tank to the Carbon Plant. Small amounts of a petroleum-based product, LCOR, are sometimes used to adjust the fluidity of the liquid pitch. LCOR is stored in 55-gallon drums and, when used, is consumed in the anode-baking process. Typically, about two 55-gallon drums of LCOR are used each year, and no more than four drums are on-site at one time. The LCOR drum in use is placed in a cradle and hard-piped to the liquid pitch circulation system. Full drums are stored on pallets in a paved area with stormwater containment. Empty LCOR containers are managed at the Storeroom drum accumulation area and recycled as scrap steel. The drum accumulation area is described in Section 2.5.6.

2.5.2 Potrooms

Figure 2-5 is a block diagram of Potroom processes. Aluminum is produced from alumina in electrolytic cells called "pots." Each pot consists of a steel shell lined with insulator brick. The cathodes of the electrolytic cell are blocks of carbon into which steel collector rods are embedded. The anodes are blocks of carbon connected to copper rods. A bath of molten alumina and cryolite (sodium-aluminum fluoride electrolyte) separates the cathodes and anodes. Bath, alumina, and aluminum are solids at room temperature.

The production and fate of the anodes are discussed in Section 2.5.1. Gaseous emissions from the aluminum reduction process, including hydrogen fluoride, are treated in fluidized-bed alumina dry scrubbers. Reacted alumina from the scrubbers is used in the potlines. Bath is removed from the process in several ways. Bath attached to anode butts when they are removed from the pots is crushed and returned to potlines 1A, 1B and 4B. Excess bath from these lines is siphoned from the pots into tubs. It freezes in the tubs and is placed in a silo from which it is sent off-site for crushing to an appropriate size range. The crushed "tub" bath is returned as "bag bath," which is added to new or rebuilt pots as they are put on line. Some bath gets removed from the pots when the aluminum is siphoned out. This bath is manually skimmed onto the floor of the potroom where it solidifies. A front end loader moves the skimmed bath into a silo at the east end of the potlines. The bath is placed back into pots with low bath levels.

The siphons that remove molten aluminum from the pots require regular maintenance to prevent them from becoming clogged with aluminum and cryolite bath. Until approximately 1980, siphon aspirators were cleaned on-site with caustic cleaners. This process is described in Section 14. Siphon aspirators are now cleaned mechanically with reaming equipment.

Bags from the dry scrubbers are disposed of as nonhazardous solid waste. Unusable dust sweepings and contaminated alumina are collected and disposed of as nonhazardous solid waste through the on-site dust-handling facility. Prior to 1992, scrubber bags, dust sweepings, and contaminated alumina were disposed of in the on-site landfill.

Pot life ranges from 2 to 4 years. When pots fail, it is usually a result of penetration of molten metal around the cathode collector bars or through the steel shell. Failed pots are sent to the Pot Breakout Building, Building 65, where a determination is made whether the pot can be repaired. When a pot fails beyond repair, the entire cathode block, brick insulation, and collector bar ensemble is broken out and replaced.

When a failed pot is removed from the potline, some residual molten aluminum remains in the pot. This metal solidifies into a pot pad. The cooled pot pads and some associated bath material are removed. Pot pads are shipped off-site for secondary smelting. The materials remaining in the pots are broken up in place with a hydraulic ram. The broken contents are then dumped from the pot shells. The steel collector bars are removed and recycled as scrap metal. The spent potliner is accumulated for less than 90 days in covered tubs in Building 66 while awaiting transportation to a hazardous waste landfill as listed hazardous waste (K088).

Originally, monolithic cathode linings made entirely of cathode paste were baked in place in the electrolytic cells. When spent, they contained about 1 to 2 percent cyanide. In December 1980, KACC switched to prebaked cathode blocks, which contain approximately 0.1 percent cyanide when spent. Recent data indicate that current concentrations of cyanide in spent potliner are even lower. Section 4.2 of this report describes former spent potliner management at the facility.

2.5.3 Cast House

Figure 2-6 is a block diagram of Cast House processes. Major inputs to the Cast House are crucibles of molten prime aluminum, billets, ingots, and sows of prime aluminum or alloy, scrap aluminum returned from customers, scrap aluminum generated and recycled within the facility, alloying metals, and fluxes. Induction furnaces melt some types of scrap for reuse in the production of ingots. The induction furnace produces a baghouse dust that is collected in covered bins and managed at the on-site dust management facility. Prior to 1992, baghouse dust was disposed of in the on-site landfill. Melting furnaces are used to introduce alloying metals and to melt certain scrap. Fluxes are added to the metal in the furnaces to remove impurities. The furnaces are fueled by natural gas. Metal removed from the holding furnaces is direct-chill cast into aluminum ingots. Contact cooling water from the casting process is recirculated through a cooling tower. Cooling tower blowdown is sent to the 002 interceptor basin.

The combination of fluxes and impurities in the molten aluminum alloys forms a material called dross. Dross is skimmed from the surface of the metal in the furnaces into bins. Free metal drains to a pan below the dross bin and is returned to the melting furnaces. The dross is sent to a rotary barrel dross cooler. The cooled dross is sent to an off-site dross recycler. Baghouse dust from the dross cooler is collected and managed separately from the other dusts as a nonhazardous waste. Baghouse dust from the dross cooler has not been disposed of on-site.

When furnaces need to be rebuilt, removed furnace brick is sent to an off-site solid waste landfill. Prior to 1992, furnace brick was disposed of in the on-site landfill. This brick is not used as roadbase material on-site.

2.5.4 Fabrication Plant

Figure 2-7 is a block diagram of Fabrication Plant Processes. The Fabrication Plant is where cast ingots of aluminum alloy are transformed into plate, sheet, and coil, and prepared for sale to customers.

The Hotline uses an emulsified coolant that consists of 95 percent demineralized water and 5 percent oil. The 5 percent oil fraction consists of 85 percent mineral oil, 12 percent fatty acids and soaps as emulsifiers, and 3 percent glycol, alcohol, and biocides (Neal, 1977). After the coolant is sprayed onto the metal, it drains into concrete coolant wells cast into the mill floor below the rolling mills. Approximately 225,000 gallons of coolant are in the Hotline coolant recirculation system (approximately 75,000 gallons for each of the three hot mills). The coolant from each mill drains into a receiving tank constructed in the basement below the mill. The coolant from the 168-inch mill is settled and skimmed, then pumped directly back to the mill. The coolant from the 110-inch and 112-inch (or 5-stand) mills is pumped through pipes within the basement to the Oil Reclamation Building. In the Oil Reclamation Building, the coolant flows through a Hoffman filter where it passes through filter paper to remove solid contaminants. The coolant is then returned to the Hotline. Used filters are placed in bins and moved to the pad at Tank 1, where coolant drains into the sump at Tank 1 and enters the Oil Recovery System. The filter paper is managed with other nonhazardous solid waste and disposed of in an off-site landfill. Prior to 1992, the filter paper was disposed of in the on-site landfill. Sumps cast into the concrete floor of the basements beneath the hotline mills receive lubricants and hydraulic oils from the rolling mills and drips of coolant from pumps and valves in the coolant recirculation system. The contents of these sumps are pumped to Tank 1 where they enter the Oil Recovery System. These sumps are discussed in greater detail in Section 22.4.

Hotline coolant is checked on a daily basis for several performance parameters. As indicated by the performance parameters, waste coolant is removed from the Hoffman filters through an underground pipe into Tank 1. Figure 2-8 provides a block diagram of the Oil Recovery System. The Oil Recovery System consists of two double-lined surface impoundments, a tank farm, and a sprayfield. The surface impoundments provide 2 to 3 weeks of retention time during which the waste coolant oil and water fractions separate. The oil fraction is skimmed from the ponds and pumped to one of four tanks in the Tank Farm. The recovered oil is then transferred to the Boiler House Day Tank and burned in an industrial boiler. The transfer of waste coolant to the surface impoundments is conducted through a 10 inch fiberglass underground gravity pipe. Recovered oil is pumped back to the tank farm through a 3-inch Nipak pipe. Past management of Hotline coolant is discussed in Section 9 of this report.

The water portion of the Hotline coolant is demineralized groundwater. The groundwater is pumped from wells F-8 and F-9 located south of the main industrial facility area. The groundwater is demineralized in ion exchange units located in the Oil Reclamation Building. The ion exchange resins are regenerated with sulfuric acid and sodium hydroxide. The regeneration wastewater is neutralized before it is released to the 002 interceptor basin.

The Cold Mills have neat oil coolant/lubricant systems that use a low-flash point kerosene-weight coolant. The coolant is recirculated from cast concrete collection pans beneath each mill. The coolant is piped from the collection pans to aboveground steel tanks located in the basement areas underneath the rolling mill (381 and 384 mill) or located in an adjacent mill-floor level room (386 mill). From the tank, the coolant is pumped to filters located near the tank associated with each mill. The filters are precoated with diatomaceous earth. The filter paper and diatomaceous earth are placed in bins, which are moved to the pad at Tank 1. Free flowing coolant is allowed to drain into the sump at Tank 1, thereby entering the Oil Recovery System. The filters and diatomaceous earth are disposed of as nonhazardous solid waste. These filters are managed separately from other solid wastes generated at the site. Sumps cast into the concrete floor of the basement beneath the cold mills receive drips of coolant from the pumps and valves in the coolant recirculation system. The coolant is returned to the recirculating system. Two sumps located in the cold mill basement can receive fluids such as water or other materials that would adversely affect the coolant properties. The contents of these sumps are pumped to Tank 1 via the sumps in the hotline basement floor. These sumps are described in greater detail in Section 22.4.

Finishing Department processes include precision metal slitting to the appropriate product size. The slitters are lubricated and cooled using a light naphtha cut oil. Coolant is filtered through a canister filter adjacent to the mill and recirculated from the leveling line. Finishing mills 575 and 511 use coolant on a once-through basis. The coolant that drips to pans beneath the slitters is removed by vacuum truck and recycled off-site. In the past, this oil was managed in the Oil Recovery System.

Fabrication Plant processes generate aluminum scrap, which is collected and returned to the Cast House. The first step of aluminum fabrication is scalping, in which the broad face of the ingot is sawed off. As the ingot is milled, its irregularly shaped leading edge is sawed off. In later fabrication steps, plate is sawed to size, and coil is run through slitters to provide a constant and correct product width. Scrap is collected in bins labeled for the specific alloys they contain. This scrap is returned to the Cast House for remelting. The "recovery rate" is the percent of aluminum entering scalping that is shipped as finished goods. In 1995, the recovery rate was 66 percent.

Cuttings from the machine shops and saws are sent to the pad at the Tank 1 sump. Oils drain into the sump. The drained cuttings are sent off-site to a secondary smelter for recycling.

From 1960 through 1965, the facility operated three coil coating lines, the 18-inch, the 48-inch, and the 66-inch. The coil coating lines were located in the C-Bays (refer to Figure 2-2B) within the Fabrication Plant. On each coil coating line, rollers were used to apply paint to building products. A degreasing line was also associated with coil coating. Spent degreasing solvents were drummed and sent to an off-site recycler. Paint storage and mixing occurred in block concrete rooms within the C-bays. When coil coating was discontinued, the associated equipment was dismantled and removed.

2.5.5 Rectifier Station and Transformers

The Rectifier Station supplies electric power to the Potrooms. Electricity is brought into the facility by way of high tension wires. The Rectifier Station transforms the incoming electricity to the proper voltage and amperage. Electricity used in other parts of the facility goes directly to transformers at the Cast House and Fabrication Plant.

PCB-containing transformers have been used at the facility. Since the manufacture and sale of PCBs were discontinued, the facility has instituted a program for phasing out existing PCB transformers. As of October 1996, all PCB transformers have been removed from service. Table 2-3 is a list of transformers that contain PCB-contaminated oils as of October 1996. Transformers containing PCB-contaminated oil are managed in accordance with TSCA regulations.

The Rectifier Station operates 72 oil-filled transformers and 17 oil-filled circuit breakers, and has a program for reusing oils. The transformers receive new oil. Non-PCB transformer oil is reused in breakers. Oil drained from the breakers is sent to an off-site oil reclaimer. Three tanks are located in the Rectifier Station for storage of dielectric oils. One tank holds new oil. The other two are typically empty and are used to temporarily hold used oil prior to reuse or transport off-site. PCB oil and PCB-contaminated oil removed from transformers are sent to appropriate off-site facilities for disposal or recycling depending on their PCB content.

2.5.6 Plant Maintenance and Support

Machine shops and electrical maintenance shops are situated at several locations within the RAC facility. Each machine shop has parts cleaners and generates dirty rags. The parts cleaners are serviced by a commercial vendor. The equipment used in the production of aluminum requires continuous preventive maintenance, including the replacement or replenishment of hydraulic oils and lubricants. At some pieces of machinery, fluids drain into collection pans and are removed from the pans by a vacuum tank truck, which transports them to the Oil Recovery System. Some hydraulic oils and lubricants are removed to steel containers and transferred to Tank 1 for processing in the Oil Recovery System or transferred to an off-site recycling facility.

As shown in Figure 2-8, waste oils and hydraulic fluids can enter the Oil Recovery System by two routes. High water content oils enter through the sump at Tank 1 and are processed in the Oil Recovery Ponds. Low water content oils enter through the sump at the Tank Farm and are mixed with the recovered oil for use as boiler fuel or are transferred to an off-site recycling facility. In the past, low water content oils were also managed in the Oil Recovery Ponds. Sumps and piping that manage used oils are discussed in greater detail in Section 22.4.

The facility phased out the use of halogenated solvents in 1990. Parts cleaners now use mineral spirits. The electrical maintenance shops still use small quantities of 1,1,1-trichloroethane in aerosol cans to clean electrical motor contacts.

A garage for maintaining and cleaning Reduction Plant vehicles is located on the southwest side of the Carbon Plant. The Fabrication Plant garage is located on the north side of the main building and south of the Fabrication Plant Laboratories (see Figure 2-2). Materials used by the garages include motor oils, transmission fluids, lubricating oils, antifreeze, and mineral spirits. Used oils and other fluids from garage activities are placed into a steel container. The steel container has legs such that its bottom surface can be observed for leaks. When full, the container is drained into a tanker truck for off-site recycling. In the past, this material was managed in the Oil Recovery System. Similar steel containers are in use at the

Fabrication Yards & Grounds garage and outside the Fabrication Plant F-6 bay south door (to manage the fluids pumped from cold mill and slitter sumps). Metal cuttings from the bins are drained at the Tank 1 pad and disposed of off-site as nonhazardous solid waste. Water from washing or steam-cleaning vehicles drains to the 004 interceptor basin from the Reduction garage and to the 002 interceptor basin from the Fabrication garage. .

A 1,500-gallon concrete sump is cast into the floor of the Fabrication Plant maintenance garage in the northeastern corner of the Fabrication Plant (see Figure 2-2B). This sump was initially identified as an underground storage tank (UST). The sump was subsequently removed from the UST program because it does not meet the definition of an underground storage tank under the regulations. The sump measures approximately 6 feet by 6 feet by 6 feet and is covered by a grate. Oily equipment is set on the grate to drain. A pump transfers the oil into an oil dumpster located outside the building. The oil dumpster is constructed of steel and sits on pallets in a paved area. The oil is removed from the dumpster by a vacuum truck and sent to an off-site oil recycler.

Paints are used for various purposes throughout the facility. Cans of spray paint are routinely used for marking and labeling items such as product and scrap bins. Empty spray paint cans are punctured, drained, and then placed into drying baskets in hazardous waste accumulation areas throughout the facility. Dried spray paint cans are managed as a solid waste. Paints used for plant maintenance are handled similarly. The paint is drained into drums in the accumulation areas and the open cans are placed in the drying baskets. The accumulated waste paint and solvents are managed in accordance with hazardous waste generator regulations and manifested to an off-site hazardous waste facility.

The facility operates and maintains a fueling station for plant trucks and automobiles. The fueling station is located between the Cast House and Fabrication Plant as shown in Figure 2-2B and includes three 10,000-gallon underground tanks and associated underground piping. Two tanks contain gasoline, one contains diesel fuel. The system is equipped with an automated tank-monitoring system. The fuel tanks are operated under West Virginia Underground Storage Tank regulations.

Six other underground tanks were formerly located in the same vicinity of the plant. The tanks were associated with Fabrication Plant cold rolling mill operations. All six tanks were constructed of carbon steel and had capacities of 12,000 gallons. Three of the tanks were installed in 1956 and three were installed in 1975. Underground piping associated with the tanks was replaced with aboveground piping in the mid 1980s. All six tanks contained non-halogenated petroleum-based products. The tanks did not contain waste. All six tanks passed their tightness tests in 1988. However, when two of the tanks failed their tightness tests in 1990, and RAC opted to close all six tanks. The tanks were excavated and removed in October 1990. A preliminary subsurface investigation indicated the presence of elevated levels of total petroleum hydrocarbons (TPH) in the vicinity of the tanks to the maximum sampling depth of 30 feet below ground surface. A workplan was submitted to the West Virginia Department of Natural Resources Underground Storage Tank Division in April 1992 for further investigation of releases from these six tanks. It is anticipated that further action concerning these tanks will be conducted as required by the state agency.

Vehicles used within the plant buildings are powered by batteries. A room located within the Fabrication Plant is used to recharge the batteries. Spent batteries that can no longer be recharged are returned to the supplier for proper recycling or disposal.

Many raw materials are received at the facility in 55-gallon drums. Most of these raw materials are lubrication oils, cutting oils, and coolants. Empty drums are either returned to the supplier for reuse or sent to a drum recycler. Empty drums are accumulated in two locations at the facility. Drums associated with the hotline coolant system (containing various coolant additives) are stored in a covered area just south of the Oil Reclamation Building. When empty, those drums are accumulated in the same area until they are returned to the suppliers. This area is shown in Figure 2-2B. Empty drums from the remainder of the facility are accumulated in the Storeroom Area located just north of the Fabrication Plant as shown in Figure 2-2B. The Storeroom drum accumulation area is paved. Stormwater from the area drains to the 002 Interceptor Basin.

The facility maintains two on-site laboratories for quality control of raw materials and products. Environmental monitoring samples are sent to third-party laboratories for analysis. From time to time, excess, off-spec, or out-of-date laboratory chemicals are disposed as hazardous waste in a lab pack. Other laboratory hazardous wastes are accumulated at a satellite accumulation area within the laboratory for off-site disposal as hazardous waste.

2.5.7 Wastewater

The facility operates several wastewater systems. Sanitary wastewater generated by the facility's 2,800 employees is treated in a secondary treatment plant located west of the Reduction Plant. The sanitary treatment plant consists of primary clarification, rotating biological contactors, secondary clarification, and chlorination. Sludge generated by the system is dried on sludge drying beds and disposed of as nonhazardous solid waste. Prior to 1974, the facility operated two primary treatment facilities. The primary systems consisted of comminutors, "clarigesters" (which provide both the functions of primary clarification and anaerobic sludge digestion in a single structure), chlorinators, and sludge drying beds. The Reduction Plant primary system discharged to Outfall 004. The Fabrication Plant primary system discharged to the Outfall 002 Interceptor Basin. The secondary system was installed in 1974 at the Reduction Plant, and effluent from the Fabrication Plant primary facility was then piped to the Reduction Plant secondary facility.

A septic tank/drainfield system was installed at the site in the mid 1960s to manage sanitary wastewater from the Box Shop, Project Engineering, Project Construction, and the Commodity Products areas. The septic tank had a volume of 1200 gallons, and the drainfield consisted of four 100-foot long perforated tile lines. The septic tank system was removed in the late 1970s. The approximate location of the septic tank system is shown in Figure 2-2B.

NPDES permit WV0000779 permits discharges from five outfalls, three external (001, 002, and 004) and two internal (104 and 204). A block diagram of sources to the outfalls is shown in Figure 2-10. Four other outfalls (003, 005, 006, and 007) have been included in the 1992 application for a stormwater discharge permit. Outfalls 001, 002, 006, and 007 service the Fabrication Plant and the south end of the Ravenswood facility property. Outfalls 003 through 005 service the Reduction Plant and the north end of the Ravenswood facility property. Water discharged through Outfall 001 passes through a 20,000 gallon concrete interceptor basin. The basin is equipped with oil skimming equipment. If a spill were to occur within the 001 drainage area, flow from the interceptor basin could be stopped until the spilled material is retrieved. Water discharged through Outfall 002 passes through a 870,000 gallon earthen interceptor basin. Industrial and storm water discharged through Outfall 004 passes through a 1,222,000 gallon earthen interceptor basin. These interceptor basins have oil skimming equipment and containment booms that keep floating oil from the outfall. The locations of the outfalls and the areas contributing stormwater to the outfalls is provided in Appendix A-2. Section 22.5 provides greater detail about the interceptor basins and the processes and stormwater drainage areas contributing to the outfalls.

Oily wastewater generated from Hotline coolant and other related sources is handled separately from other industrial and sanitary wastewater at the Ravenswood facility. As described in Section 2.5.4, oily wastewater is phase-separated in two surface impoundments, Pond 1 and Pond 2. The water phase is land-applied in a 56-acre sprayfield. Following phase separation, the water phase typically contains up to 0.5 percent oil. Table 2-4 summarizes the influent sources to this system as stated in the 1991 NPDES permit application. During adverse conditions, such as high river stages or freezing weather, the water phase is retained in the surface impoundments. Empty tanks in the Tank Farm may be used for temporary storage if the ponds are near capacity. The emergency spill basin located adjacent to Tank 1 has provided last-resort emergency storage capacity. It has been used from 0 to 2 times per year for durations up to a month, depending upon weather conditions. Routine monitoring for the sprayfield consists of quarterly monitoring of seven wells and quarterly soil sampling. See Section 11 for further discussion of the sprayfield.

2.6 SUMMARY OF PERMITS, ENFORCEMENT ACTIONS, AND RESPONSES

As mentioned earlier, this facility was previously owned and operated by KACC. In February 1989, RAC purchased the entire facility, except for the Potliner Pile and Potliner Vault. RAC has attempted to summarize the facility's relevant history to the best of its knowledge and information in this section. The history of the facility permits is presented first in Section 2.6.1. Enforcement actions related to the permits are summarized in the permit section. A summary of other enforcement actions not related to the facility's permits are then presented in Section 2.6.2. Certain offices in the Department of Environmental Protection (DEP) were formerly in the Department of Natural Resources (DNR). References to these regulatory agencies are used as appropriate for the appropriate time period discussed.

2.6.1 Permits

The facility operates under RCRA interim status (related to closure of the former Oil Recovery System) and a number of other permits, including a National Pollution Discharge Elimination System (NPDES) Permit, several Water Pollution Control (WPC) Permits, and an air permit. The NPDES Permit sets the discharge limits for the Ohio River outfalls, Outfalls 001, 002, and 004, and for the internal outfalls, Outfalls 104 and 204. An application has been submitted for stormwater discharge from Outfalls 001 through 007. The closed Industrial Landfill, where nonhazardous solid wastes generated at the plant were disposed, and the Sprayfield, where the water phase from the Oil Recovery Ponds is applied, have operated under WPC Permits.

A one-time WPC Permit was issued for the Gravel Dross Landfill. A RCRA Part A Permit application was submitted for the former Oil Recovery System, but this was amended when KACC switched from lead-based gear lubricants to non-lead-based gear lubricants in the hotline rolling mills and performed interim status closure of the Oil Recovery System and the associated equipment. Oil pond post-closure activities are currently under interim status, and a Part B Post-Closure Permit application was submitted in 1989. The Part B permit application is currently undergoing review. The facility operates under a state-issued air permit. Each of these permits is discussed in more detail in the following sections.

2.6.1.1 National Pollution Discharge Elimination System Permit - Permit No. WV0000779

NPDES Permits are designed to control the flow and concentrations of constituents of direct discharges to natural water bodies. NPDES Permits, which are typically issued for 5-year periods, and establish discharge limits and requirements for monitoring.

The facility's NPDES Permit was first issued in July 1974, with an effective date of August 31, 1974. This permit listed five discharge points: Outfalls 001 through 005. The sources to these outfalls included plant processes and surface water drainage. Among the regulated constituents were chromium, chemical oxygen demand (COD), total suspended solids (TSS), total solids (TS), fluoride, pH, oil and grease, fecal coliform, and cyanides.

In 1969, KACC began extracting groundwater containing cyanide from select production wells, termed blocking wells, and then discharging this water to the river. The cyanide in the groundwater had resulted from leaching of cyanide from spent potliner (see Section 4 for details). In 1976, KACC was issued a Findings of Violation and Order for Compliance by US EPA in response to violations of the NPDES Permit. These violations included exceedences of the limits established for TSS, pH, and oil and grease from Outfall 001; cyanide and chromium from Outfall 002; and cyanide and chromium from Outfall 004. KACC responded by proposing measures to maintain compliance limits.

In January 1979, a new draft NPDES Permit was prepared by US EPA. The new permit was approved and became effective on June 25, 1979. In November 1979, US EPA issued an Administrative Order to KACC for violations of its NPDES Permit involving exceedences of the oil and grease, TSS, cyanide, and pH limits. KACC denied that exceedences of oil and grease and TSS limits occurred. Further, KACC provided technical justification for altering limits on fluoride, COD, TSS, and cyanide. On September 1, 1980, a new NPDES Permit was issued with revised fluoride, TS, TSS, and cyanide limits.

In 1983 and 1984, KACC contracted to have river mixing zone studies performed to determine the size of the mixing zone for wastewater discharges. These studies determined that the river mixing zone was sufficient to prevent harmful effects from the facility's wastewater discharge. In 1984, KACC submitted a renewal application for their NPDES Permit. The new NPDES Permit was issued on February 11, 1985. This permit included sampling from two new locations: Outfall 104 from the anode cooling tower and Outfall 204 from the sanitary treatment plant. These two sources discharge into Outfall 004 and had previously been monitored as a combined effluent along with the blocking well discharge. Also, on February 11, 1985, DNR issued Order of Compliance No. 1596, which established interim monitoring requirements and a compliance schedule. KACC subsequently appealed portions of this NPDES Permit. An agreement was reached between KACC and DNR on April 6, 1987. A minor modification to the NPDES Permit was approved by DNR on October 23, 1987.

In September 1989, RAC submitted a renewal application to DNR for the NPDES Permit. The permit application was subsequently updated at the request of DNR to include additional information and more up-to-date sampling results. The application was resubmitted on December 17, 1991. DNR again requested additional information in July 1992. RAC responded on September 8, 1992 with detailed descriptions of the measures being taken to reduce oil and grease discharge from Outfall 001, and KACC submitted information concerning trends in cyanide concentrations in the Outfall 004. Because the NPDES Permit is still under review by the agency, RAC is required to comply with the 1985 NPDES Permit. The sources of discharges to the outfalls under the current conditions are shown in Appendix A.

In January 1993, DEP issued Order of Compliance No. 3357, citing various NPDES violations arising from inefficiencies resulting from a work stoppage at the facility. These inefficiencies were corrected prior to the end of the work stoppage.

To comply with the NPDES permit, RAC currently collects and analyzes groundwater samples on a monthly basis from each of the six blocking wells. The samples are analyzed for total and free cyanide, fluoride, and other general groundwater quality parameters. In addition, RAC also collects and analyzes groundwater samples between 4 and 6 times each year from the 11 Dames & Moore wells and RT-5. These samples are analyzed for total cyanide, fluoride, and other general groundwater quality parameters.

2.6.1.2 Water Pollution Control Permits

The facility has operated under WPC Permits for the Industrial Landfill and Sprayfield. This facility operated under a one-time WPC permit for the Gravel Dross Landfill. The WPC Permits issued for the Potliner Pile and Potliner Vault are not summarized in this report because they are not part of RAC's facility and are beyond the scope of RAC's Consent Order. The WPC Permits associated with each of the units currently owned by RAC are described below.

Sprayfield - Permit No. IWL-6305-85

In 1977, KACC submitted WPC Permit Application No. I-1024 for a WPC Permit for the application of water phase, water separated from waste coolant in the Oil Recovery Ponds, on an area of land southwest of the plant, hereafter referred to as the Sprayfield. The water phase consists of water and less than 0.5 percent oil. This application resulted in the issuance of WPC Permit No. IW-5943-77.

In 1982, KACC applied for a renewal of its permit. Permit No. IW-5943-77 was extended to February 28, 1984, to allow DNR time to review the application for re-issuance. A new WPC Permit, No. IWL-6305-85, was issued on March 1, 1985, with an expiration date of February 28, 1990. This new permit required KACC to perform initial comprehensive, annual comprehensive, and quarterly sample analyses on monitoring wells A through G (see Plate 2) for a number of parameters, including pH, TSS, total dissolved solids (TDS), specific conductance, COD, total organic carbon (TOC), iron, lead, oil and grease, and chlorides. The permit also required soil sample analyses for iron, lead, chlorides, and oil and grease two times per year.

KACC appealed portions of the Sprayfield permit in 1985, and an agreement was reached and finalized between KACC and DNR on the permit requirements on April 6, 1987. In 1988 and 1989, the WPC Permit was further modified to account for upgrades made to the Oil Recovery System and for the addition of new spraybirds.

On June 13, 1989, DNR conducted a Compliance Sampling Inspection and determined that RAC's sampling program was satisfactory.

At the request of DNR, RAC submitted Permit Application No. WV0077488 on March 6, 1991, for operation of the Sprayfield. DNR denied the permit in November of 1993. RAC and DNR entered into Consent Order No. 3479, which provides for continued operation of the Sprayfield and submittal of a schedule for replacing the existing Sprayfield system with some other type of system. RAC has recently investigated several alternatives to the current Sprayfield system and has completed a pilot study program in conjunction with West Virginia University (WVU). The treatment system is currently being modified based on the results of these studies.

In addition, RAC performs groundwater and soil monitoring in accordance with the Sprayfield WPC Permit requirements and with the requirements of the 1993 Consent Order. RAC is currently analyzing groundwater collected quarterly from nine wells in the vicinity of the Sprayfield for a variety of parameters, including general groundwater quality parameters listed in the WPC Permit and aluminum, antimony, and Priority Pollutant List volatile organics required by the Consent Order. Soil samples are collected in the Sprayfield twice per year and analyzed for EP toxicity for lead, leachable chloride, oil and grease, pH, and percent solids as required by the WPC Permit. Composite samples are collected and analyzed during each sampling event, with one composite sample for each of the spraybird areas. Samples are collected at 8-inch and 24-inch depths.

<u>Industrial Landfill - Permit No. IW-6310-85</u>

Before 1960, KACC began disposal of wastes in an Industrial Landfill located southwest of the facility. A permit application was submitted on September 29, 1975, and a permit was subsequently issued by DNR.

On January 8, 1976, KACC submitted WPC Permit Application No. I-893-L for the Industrial Landfill. In response to the application, DNR recommended that KACC install a network of wells close to the Industrial Landfill. KACC installed three monitoring wells (M-1 through M-3) in the vicinity of the Industrial Landfill in late 1976. WPC Permit No. IW-6031-78 was issued on December 5, 1978. The permit required initial comprehensive, annual comprehensive, and abbreviated quarterly monitoring from well M-2.

A new WPC Permit, No IWL-6310-85, was issued to KACC in September 1985. The new permit required initial comprehensive, annual comprehensive, and abbreviated quarterly monitoring from four monitoring wells in the vicinity of the Industrial Landfill and the preparation and submittal of quarterly monitoring reports. KACC subsequently appealed portions of the Industrial Landfill Permit, and an agreement resolving the appeal was reached and finalized between KACC and DNR on April 6, 1987.

In 1987, KACC applied for a permit modification to the Industrial Landfill WPC Permit for the one the placement of stabilized residue from the closure of the Oil Recovery Ponds into the Industrial Landfill. This permit modification was approved in January 1989. Several other minor permit modifications were approved by DNR between 1987 and 1989, including the addition of several other groundwater quality parameters (total organic halogens, specific conductance, oil and grease, phenolics, toluene, xylenes, etc.) to the list of constituents analyzed quarterly.

A permit for closure of the Industrial Landfill was issued on October 23, 1992. The permit required quarterly analyses of general groundwater quality parameters to be performed from samples collected from monitoring wells MW-1, MW-2, MW-3, MW-4, LF-1, and LF-2. These wells monitor the deeper alluvial aquifer beneath the Industrial Landfill. In October 1996, the permit was modified to allow semiannual well sampling. The closure of most of the Industrial Landfill was accomplished by 1993. The landfill ceased receiving waste in November 1992, with the exception of some dust wastes which were disposed of in the Industrial Landfill until 1993 under a special variance. Final closure of the last 6 acres of the Industrial Landfill began in August 1996. In December 1993, Modification No. 1 to the Industrial Landfill permit was issued formalizing quarterly sampling of newly installed wells LF-3, LF-4, LF-5, LF-6, and LF-7 and the existing well K-209 in addition to the wells listed above. This second set of wells has screens that intersect the water table and allow monitoring of the uppermost portion of the aquifer.

Currently, RAC is analyzing groundwater samples collected from the 12 wells listed previously for a number of general groundwater quality parameters on a quarterly basis as required by the closure permit. In addition, groundwater samples from wells LF-3 through LF-7 and K-209 have been analyzed for Priority Pollutant List volatile and semivolatile organics on a quarterly basis since the beginning of 1994.

Gravel Dross Landfill - Permit No. IW-588-76

The Gravel Dross Landfill was operated by KACC for some period between 1977 and 1978. The gravel dross consisted of pea gravel (35 percent by weight), oxides of aluminum and magnesium (64 percent by weight), chloride of aluminum and magnesium (less than 0.5 percent by weight), free aluminum (less than 1 percent by weight), and trace amount of nitrides and carbides. The basin was to be 200 feet wide by 200 feet long by 4.5 feet deep and to be lined top and bottom with a mixture of soil and bentonite. A one-time, 1-year WPC Permit was issued by DNR to KACC. This permit has since expired.

2.6.1.3 RCRA Status

Table 2-5 is a summary of the original 1980 Part A permit application and subsequent revisions that were submitted to US EPA between November 1980 and the present. The original application included the following waste codes: F012 - quenching wastewater treatment sludges from metal heat treating operations where cyanides are used in the process; K088 - spent potliner; D008 - oil exceeding 5 mg/L leachable lead; and D002 - corrosive waste from demineralizer backwash. The table summarizes the changes that were made from one revision to the next.

Several units were included in the initial 1980 application that were subsequently deleted in the 1982 application with the explanation that the units did not manage hazardous waste. The initial inclusion of these units was a conservative "protective listing" to ensure future interim status for the unit, if necessary, once confusion about definitions of listings was resolved. The following units were determined to have been listed on the initial application in error - no hazardous wastes were ever managed in the units: Unit 6 - Hazardous Waste Storage Pile; and Unit 12 - Horizontal Heat Treat Quench System. The Horizontal Heat Treat Quench System was not the type included in the listing and F012 waste was never managed at the facility. Additionally, Unit 11 - Siphon Cleaning System and Unit 13 - Hotline Neutralization Tank were determined to be elementary neutralization units exempt from permitting requirements in accordance with 40 CFR 270.1(c)(2)(v).

Between 1982 and 1988, the waste code F002 (spent halogenated solvents) was included on the Part A permit at 0.035 tons per year (7 gallons per year at an average specific gravity of 1.2). The process code for the spent solvent was S02 - storage in tanks.

In November 1980, KACC submitted its original RCRA Part A Application to obtain interim status for operation of the Oil Recovery System for management of waste coolant from the hotline rolling mills. This waste coolant consists of 95 percent water and 5 percent soluble oil. In June 1982 and in August 1988, KACC revised its RCRA Part A Application. In January 1989, RAC submitted a revised RCRA Part A Application due to the change in ownership of the facility, excluding the Potliner Vault and Potliner Pile.

Prior to mid 1985, waste coolant contained low levels of lead. Lead bearing compounds entered the hotline rolling mills coolant system from gear lubricants. Since some samples of the waste oil recovered from the Oil Recovery System contained lead concentrations in excess of 5 mg/L, the recovered oil had to be addressed as a RCRA D008 hazardous waste. To address this concern, KACC eliminated the use of leaded gear lubricants in early 1985. Thus, since 1985, the waste coolant has been free of lead contamination.

In October 1985, KACC submitted to US EPA and DNR a RCRA Interim Status Closure Plan for the Oil Recovery System listed in the 1980 Part A Application. This plan included the removal of the residual materials in the three surface impoundments, elimination of residual sludges in any other storage units, and cleaning of the tanks, sump, and piping equipment in the system. This plan was approved in September 1987, and closure activities began in May 1988. Since that time, the surface impoundments and associated storage tanks listed in the 1980 Part A Application have been closed according to the agency-approved interim status closure plan. The closure was certified by Roy F. Weston, Inc. in October 1989. The current Oil Recovery System is free of lead contamination and the recovered oil is managed as nonhazardous.

A Part B Post-Closure Permit Application was submitted to DNR in 1989. The permit application was for corrective measures to remove oil floating on the groundwater in the area of the Oil Recovery Ponds (see Section 9). DNR determined that the application was complete in July 1991. An updated and revised Part B Application was submitted to DNR in July 1992. In September 1992, RAC submitted an addendum to the NPDES Permit requesting authorization for discharge of pumped groundwater associated with the corrective measures proposed in the Part B Permit Application; however, the agency has taken no action on this request.

Currently, RAC collects groundwater samples from monitoring wells GM-1, GM-2, GM-4, GM-7d, and GM-8 on a quarterly basis and analyzes these samples for pH, specific conductance, total organic carbon, and total organic halogens in addition to other general groundwater quality parameters in accordance with the interim status requirements. Lead and barium are also analyzed as proposed in the Part B Application. In addition, RAC performs floating oil monitoring in 23 wells in the vicinity of the Oil Recovery Ponds.

The 1994 Part A permit revision includes management of an unspecified quantity of D008 oil, which is floating on the groundwater in the vicinity of Ponds 1 and 2. Ponds 1 and 2 were also included in the 1994 Part A permit revision in compliance with used oil regulation 40 CFR 279.12(a). This section of the used oil regulations prohibits management of used oil in surface impoundments unless the impoundments are subject to regulation under 40 CFR 265 (interim status) or 40 CFR 264 (permitted status). Thus, the used oil regulations require management of nonhazardous used oil in regulated hazardous waste units. The hazardous waste regulations specify construction, operation, and maintenance requirements for the ponds. The majority of the liquid in the ponds is waste coolant (about 5% oil), water separated from waste coolant (about 0.5% oil), and other oily wastewaters. A Part B permit application for used oil storage in the ponds was submitted in November 1996.

2.6.1.4 Air Permit

The facility operates under a state-issued air permit.

2.6.2 Enforcement Actions

The following is a summary of environmental enforcement actions not related to the facility's permits:

- In 1985, DNR issued a Consent Order based on a March 4, 1985, inspection of the KACC facility that alleged violations related to the storage drums in the Elephant Shed. In response, KACC submitted a plan for the removal and disposal of the drums in the Elephant Shed within 30 days of the receipt of the order. KACC complied with this order and removed the drums accordingly.
- On April 26, 1990, DNR conducted a Compliance Evaluation Inspection. On June 28, 1991, RAC and DNR entered into a Consent Order regarding issues related to operations at the Reduction Plant Paint Shop. Pursuant to the Consent Order, RAC agreed to pay a fine and agreed to submit a report identifying all actions taken with respect to the monitoring, testing, analysis, and remediation of any contamination caused by the alleged

release of hazardous waste constituents in the vicinity of the Reduction Plant Paint Shop. RAC conducted the activities required by the Consent Order.

On September 27, 1994, RAC and US EPA agreed on the final RCRA Section 3008 (h) Administrative Order on Consent Docket No. RCRA-III-069-CA. This Consent Order required RAC to prepare and submit several documents, including the following:

- Interim Measures (IM) Workplan and Associated Reports Addressing the Floating Oil in the Vicinity of the Oil Recovery Ponds,
- Description of Current Conditions (DCC) Report,
- Pre-Investigation Evaluation of Corrective Measures Technologies (PECMT) Report,
- RFI Workplan and RFI Report, and
- Corrective Measures Study (CMS).

RAC submitted the IM Workplan as required and the PECMT and RFI Workplan Reports were submitted concurrently with the first submittal of the DCC Report.

2.7 PAST SPILLS

As with most large industrial facilities, some spills and releases have occurred in the past at the facility. Even though RAC has only owned the facility (excluding the Potliner Pile and Potliner Vault) since 1989, an attempt has been made to summarize past releases resulting in areas to be investigated in the RFI. These releases are described below in chronological order. Copies of the release reports are contained in Appendix A. These reports were documented in the SPCC.

Water-based coolant is used in the fabrication process when rolling the aluminum into sheets and plates in the hot-line mills. Used hot-line coolant is recycled to the roll lines after passing through the filters as described in Section 2.5. After recycling the coolant several times, it is transferred from the roll lines to Tank 1, then to the Oil Recovery Ponds. The gravity settling in these ponds results in the separation of the coolant emulsion into an oil phase and a water phase. The water phase is applied to the Sprayfield, and the oil phase (recovered oil) is pumped first to the Tank Farm and then to the Boiler House Tank. Most oil releases have been associated with the use of the water-based coolant or the operation of the Oil Recovery System. Waste coolant consists of 95 percent water and 5 percent oil. Water phase from the Oil Recovery Ponds consists of water and less than 0.5 percent oil. Recovered oil has less than 5 percent water content. Coolants in the cold mills and finishing are neat oils. Oil releases described in the summaries that do not specify the source of the oil can be assumed to refer to undiluted oil.

The following is a summary of known releases:

- On July 15, 1973, a reported spill of neat oil coolant in the 130-inch Cold Roll Mill oil house was investigated. An estimated 50 gallons of waste coolant were released. Corrective measures were initiated to prevent basement sumps in the roll shop area from discharging into the plant outfalls.
- On January 28, 1974, a spill of No. 2 fuel oil occurred. An estimated 50 gallons of oil flowed into Interceptor Basin 004. Most of this oil was recovered by KACC. Due to a heavy rain which impeded the normal operation of the basin, a small amount of oil bypassed the restriction devices and entered the river. The weirs were modified to prevent future discharges.
- On April 15, 1975, a waste coolant spill occurred at Outfall 001. An estimated 150 gallons of waste coolant spilled, consisting of 95 percent water and 5 percent oil. Consequently, only 7.5 gallons of oil were released. The storage vessels in the Fabrication Plant holding waste coolant leaked through a faulty valve into the filtering system, ultimately overflowing the filter system and discharging to a floor drain. This floor drain connected to the sewers going to Outfall 001. As soon as the spill was discovered, the floor drain was plugged and the waste coolant on the floor was pumped to the oil storage area. The leaking valve was repaired.
- On July 8, 1975, an oil spill occurred at the Boiler House and resulted in a release of oil to Outfall 004. This spill was caused by a gland leakage in a transfer pump at the Boiler House. The oil leakage flowed into the storm sewer and into the Interceptor Basin 004, where approximately 700 gallons of oil were retained. However, an estimated 100 to 150 gallons of the oil reached Outfall 004. The gland was repaired, the oil in the sewer tile was removed, and the oil in the basin was hand skimmed out. In order to prevent a re-occurrence of an oil spill from this location, the land was recontoured so that future releases would drain to a sump.
- In December 1975, a spill of the water phase of waste hot-line coolant occurred at Outfall 001. Due to freezing weather conditions, the line that carried the water phase of the waste coolant emulsion from the Oil Recovery Ponds to the Sprayfield ruptured. This piping crossed over the open ditch area transporting discharge water to Outfall 001, and the breakage in the line occurred adjacent to the open ditch. Approximately 2,500 gallons of water containing less than 0.5 percent oil spilled. Consequently, it was estimated that, at most, 12.5 gallons of oil entered the Ohio River. The immediate action taken was to dam the ditch above Outfall 001 and to pump the residual from the ditch to a disposal area. The pipe was replaced and adequate drains were installed to provide a means to drain this section of pipe during freezing weather conditions. Additionally, in 1977, this section of the pipeline was buried below the frost line to prevent freezing.

- On June 10, 1978, a spill of waste hotline coolant emulsion occurred due to a closed valve in the transfer piping from Tank 1 to Pond 2. On the morning of June 11, it was discovered that the entry valve to Pond 2 had been closed and that approximately 50,000 gallons of waste coolant, consisting of 95 percent water and 5 percent oil, had backed up an old gravity drain line to the Industrial Water Tower area and had flowed to the Ohio River through a drainage ditch. Three earthen dams were constructed to retain as much of the spill as possible in the drainage ditch. By August 1978, a valve was installed on the gravity drain line to prevent this type of release in the future.
- On September 9, 1979, 463 pounds of sodium hydroxide with a pH of 12.7 was inadvertently released to the Ohio River. The sodium hydroxide originated from the 30,000-gallon spent regenerant tank located in the hotline oil reclamation building. The release occurred due to a malfunctioning sulfuric acid metering pump and pH controlling system. The malfunction was corrected.
- On January 31, 1980, a release of waste coolant occurred in the Hotline Oil Reclamation Building. Approximately 15,000 gallons of waste coolant overflowed the filter and flowed onto the floor. All floor drains in this area were plugged with the exception of one remote floor drain. The majority of the spill was contained in the building. A maximum of 3 gallons of oil flowed through Outfall 001 Conveyance to the Ohio River. On February 1, the remote floor drain was plugged.
- On May 16, 1980, oil was released from a broken transfer pipeline. An estimated 800 gallons of recovered oil were release and approximately 150 gallons reached the Ohio River. The broken line was repaired, and oil along with soil containing oil were removed.
- On September 26, 1980, a valve to an abandoned section of the domestic water supply was inadvertently opened by an employee. A portion of this abandoned section of the domestic water system is located under the Potliner Pile, which at that time had a bentonite clay liner above and below it. Upon activation of this abandoned section, water from the line made its way up through the bottom liner into the stored material of the Potliner Pile. The water stream broke through the surface of the Potliner Pile cover. Once through the cover, the water stream flowed to the Ohio River. It was estimated that 363 pounds of total cyanide, of which 108 pounds were "free" cyanide, were carried in the water stream to the river (see Section 4).

  Throughout the weekend of September 27 and 28, 1980, remedial measures were taken and appropriate notification given to the National Response Center, DNR, US EPA, and US Coast Guard. The remedial measures included the locking out of the valve involved and the subsequent physical severing of the abandoned section of the water system from the active portion. Any recoverable leachate and the associated soil were placed in a temporary waste staging area and were covered with plastic. The area where the water stream exited the cover liner of the pile was resealed with bentonite clay.
- On February 9, 1981, KACC detected a small amount of oil at Outfall 001. The emergency shut-off valve at the spillway to the 20,000-gallon Interceptor Basin 001 was closed to contain the oil. On-site sampling indicated a maximum concentration of 430 mg/L of oil and grease. The normal flow rate was around 40,000 to 60,000 gallons a day from the basin. Therefore, it was estimated that about 5 to 10 gallons of oil were

discharged. Cleanup consisted of removing the oil from the Interceptor Basin 001 and from Outfall 001 Conveyance.

- On October 8, 1981, a spill of PCBs at the facility was reported to US EPA. Three capacitors on a pallet in the salvage yard were leaking onto the pallet and the ground. Approximately 3 gallons of capacitor fluid containing PCBs had leaked out; however, at no time did any liquid enter a waterway. The capacitors, pallet, and all earth that had been in contact with the fluid were placed in appropriate drums and placed in the facility's PCB storage area. All cleanup was concluded within 1 hour after the first notification of the spill.

- On June 16, 1982, approximately 500 gallons of waste coolant, consisting of 95 percent water and 5 percent oil, were released from Tank 1 into the ditch along the adjacent road. Thus, only 15 gallons of oil were released to the ground. A vacuum truck collected the released waste coolant, and disposed of it into the Tank 1 sump from which it had been released. At no time did the waste coolant reach a navigable water source.

- On September 25, 1984, a release of approximately 1,200 gallons of sulfuric acid resulted from a leak in the middle of one end of the 2,300-gallon sulfuric acid tanks. The National Response Center and DNR were notified. The material drained into a pit next to the tank. The acid was vacuumed out of the pit into a truck containing caustic soda, which neutralized the acid. The entire area was flushed down into the pit and then this material was also vacuumed into a truck and neutralized. None of the discharge reached a waterway.

- On November 9, 1984, an oil spill occurred at Outfall 001. On November 2, 1984, a contractor drained soluble oil onto the ground. On November 9, a heavy rain carried a maximum of 14 gallons of the oil to the Ohio River by way of Outfall 001. A majority of the soluble oil was recovered and returned to the Oil Recovery System.

- On March 4, 1988, KACC discovered an oil release at Outfall 004. The National Response Center and DNR were immediately notified. The spill had occurred because the Boiler House Day Tank had overflowed. The material would have been retained in the concrete dike, but the release valve on the dike malfunctioned. Material flowed out the valve to the storm sewer drain and then to the interceptor basin. Most of the released material stayed in the interceptor basin because of the underflow weirs.

  Cleanup was initiated using absorbent material, brooms, and vacuum trucks. Follow-up investigations indicated that approximately 3,000 gallons of recycled oil overflowed from the Boiler House Day Tank. Most of this oil was recovered. In response to this release, the valve at the Boiler House Day Tank was repaired and closed.

- On July 26, 1988, a gasket malfunctioned on the PCB transformers at substation #38 at the horizontal Heat Treat Furnace. An estimated 70 gallons of fluid containing PCBs had leaked into the concrete pump pit below the transformer. US EPA and the National Response Center were immediately notified. Because the quench tank and cooling tower are connected hydraulically to the pump pit, samples were taken at each location. Sampling of the quench tank indicated levels of PCBs from less than 0.0012 mg/L. Sampling of the cooling tower indicated levels of PCBs from 0.014 to 0.022 mg/L. Both the quench tank and cooling tower were cleaned by General Electric. General Electric subcontracted out the cleanup of the pump pit to Remcor and then to OH Materials. PCB contamination was reduced to acceptable levels at all three locations.

Additionally, late in the day on July 27, 1988, KACC determined that it was necessary to pump approximately 16,000 gallons of PCB containing water to a storage tank. However, this water was inadvertently sent to Outfall 001. US EPA and DNR were notified.

- On April 17, 1989, waste coolant, consisting of 95 percent water and 5 percent oil, overflowed Tank 1 and spilled into the ditch line to a storm drain, which in turn discharged to Interceptor Basin 002. The ditch line was immediately diked to prevent further discharge to the interceptor basin. JET VAC was called to clean up the remaining waste coolant from the ditch line. No estimate could be made of the amount of material which flowed into the basin and out through the outfall. A sample taken indicated that the oil and grease concentration was approximately 8 mg/L, and the loading was 4.2 pounds/day, which was well within the discharge permit limit. The cause of the leak was determined to be a malfunctioning check valve in the line leading from the sump to Tank 1. This allowed the waste coolant to flow back through the sump when the valve at the ponds was closed and enough head pressure had accumulated in Tank 1. This malfunctioning check valve was repaired.

- On August 1, 1989, during routine NPDES sampling, a pH reading of 2.8 was recorded at Outfall 002. An investigation revealed that the source of the low pH condition was a malfunctioning acid neutralization tank in the industrial demineralization system which had been reactivated the previous week. The low pH discharge had flowed from the neutralization tank through the storm sewer system to Outfall 002. The source was immediately shut down and DNR was immediately notified. RAC initiated and continued neutralization measures at the Interceptor Basin 002 until the water was within the permit discharge limits.

  Even though this appeared to be a one-time malfunction, RAC has initiated manual pH verification prior to any discharge from a neutralization tank.

- On August 8, 1989, a PCB spill occurred at the Fabrication Plant's air compressor building transformer. There was no discharge to the ground or to any waterway. The spill was immediately reported to federal agencies as required by Toxic Substances Control Act (TSCA) regulations. The transformer is located outside on a concrete pad. The Eastern Electric Contractor's electricians were working at the air compressor building substation transformer, when the tank portion came loose at the connecting flange. This resulted in approximately 150 gallons of dielectric fluid spilling onto the concrete pad.

  The Eastern Electric Contractor's electrician moved immediately to contain the spilled dielectric fluid. A dam was constructed from Manville Ceolite material the full circumference of the concrete pad. Regular 3-M oil sorbent material was also used to soak up the spilled fluid. Parts and pieces of the sub-station and transformer that were contaminated with the spilled fluid were taken apart and/or cut off and placed in appropriate 55-gallon PCB drums for disposal. Cleaning materials were also drummed and disposed.

  The pad and surrounding soils were removed to meet TSCA standards. Current testing shows no detectable PCB contamination.

- On September 24, 1992, during a routine NPDES sampling event, a pH reading of 6.0 was recorded at Outfall 001. An accidental overflow of an acid tank due to operator error had occurred on the ground in the vicinity of the acid storage tank near the Hotline Oil Reclamation Building of the Fabrication Plant. This acid spill was entering a storm drain, which flowed into the Interceptor Basin 001. The low pH stream was immediately blocked with earth and powdered lime was applied to the wet areas to neutralize the acid. A contractor was contacted and initiated cleanup of all visible liquid and affected soils within ½ hour of discovery of the spill. Subsequent readings at the Outfall indicated compliance with the permit limits by nightfall. Inventory records indicated that a maximum of 14 gallons of 50 percent normality sulfuric acid were released, but the majority of this material was intercepted and neutralized.

2.8 AREAS TO BE ADDRESSED IN THE RFI

The RCRA Consent Order requires that the DCC describe background information about the facility relevant to possible releases of hazardous constituents or hazardous wastes. To achieve this objective, the areas listed in Sections 2.8.1 and 2.8.2 were considered.

2.8.1 Areas Listed by Versar in 1988 RFA Report

In 1986, the NUS (US EPA Contractor) Interim RFA Report listed 14 areas at the facility as SWMUs. Versar (US EPA Contractor) added three more areas to the list during their visual site inspection in 1987 and in their final RFA Report prepared in 1988. The 17 units listed as SWMUs in these reports are listed below. Their locations are shown on Plate 2. RAC does not agree that some of these areas are actually SWMUs. Some of them never existed, and some do not manage solid or hazardous waste or constituents. These issues are addressed in the text of each section dealing with these areas, where appropriate.

- SWMU 1 - Potliner Pile
- SWMU 2 - Potliner Breakout and Accumulation Buildings
- SWMU 3 - Rotary Barrel Baghouse Catch Landfill
- SWMU 4 - Tank 1 and Emergency Spill Basin
- SWMU 5 - Oil Recovery Ponds
- SWMU 6 - Tank Farm
- SWMU 7 - Sprayfield
- SWMU 8 - Boiler House Day Tank
- SWMU 9 - Elephant Shed
- SWMU 10 - Siphon Aspirator Cleaning Station
- SWMU 11 - Horizontal Heat Quench System

- SWMU 12 - Neutralization Tank
- SWMU 13 - Industrial Landfill
- SWMU 14 - Gravel Dross Landfill
- SWMU 15 - Sump at Pond 3
- SWMU 16 - Bath Storage Pile
- SWMU 17 - Cooling Tower Sludge Bins

Information required by the Consent Order for each of these areas at the facility is presented in this DCC Report along with recommendations for further investigations, where applicable. Areas or units listed as SWMUs which were never constructed, which do not meet the definition of a SWMU, or which are not susceptible to releases are noted, and it is recommended that these units be eliminated from further RFI activities.

2.8.2 Other Areas

In addition to the areas at the facility listed above, some other areas have been identified that may warrant further consideration. These areas include the following:

- Old Landfill,
- Railcar Loadout Building,
- Outfall 001 Conveyance,
- Old Northwest Pot Dump,
- Pot Soaking Piers,
- Potliner Loadout Area,
- Pot Soaking Pits,
- Northwest Pot Dump Drainage Path,
- Drainage Path from Potliner Pile and Elephant Shed and former locations of Pot Soaking Pits and Pot Soaking Piers,
- Outfall 003,
- Anode Burnoff Pile,
- Used Oil Sumps and Piping, and
- Stormwater and Wastewater System.

These areas are also described and evaluated as required in the Consent Order. Their locations are shown on Plate 2.

TABLE 2-1
LIST OF SIGNIFICANT HISTORICAL EVENTS
Ravenswood Aluminum Corporation

DATE	EVENT
March 1955	Official ground breaking.
April 1955	Earth moving began.
August 1956	The first foil produced at the facility was shipped.
November 1956	Construction of the tall stack began (613 feet high; 5,330 cubic yards of concrete).
January 1957	The first coils were rolled to finish gauge on cold mills.
February 1957	The first alumina ore was received in railcars.
April 1957	Enough pot shells on-site for one potline.
June 1957	First railcar loads of carbon materials received.
August 1957	Cathode paste plant startup.
November 1957	First power on for aluminum reduction (11/7) and first molten aluminum was tapped (11/17).
Early 1958	First metal cast from direct chill (DC) casting units.
March 1958	Hotline startup.
April 1958	Anode manufacturing started.
1959	Rotary barrel furnaces on line.
June 1959	Startup of the fourth potline (all four potlines in operation).
Pre-1960	Began use of on-site Industrial Landfill
1963	Potliner Loadout Area on riverbank and Pot Soaking Piers were constructed.
1967	Began a major expansion of the Fabrication Plant (which was completed around 1974) including the following: added the plate bay, extended the hot mill bay, widened the hot mills, expanded cold mill operations, added some finishing bays, etc.
October 1967	Constructed the first prebaked cathode block bottom pot.
1970	Potliner Loadout Area was dismantled, the Pot Soaking Piers were removed, and the Elephant Shed and Pot Soaking Pits were constructed.
1971	Oil Recovery Ponds 1 and 2 were constructed along with a temporary aboveground pipe installation in the Sprayfield.
May 1972	First potroom operational on dry scrubber.

TABLE 2-1
LIST OF SIGNIFICANT HISTORICAL EVENTS
Ravenswood Aluminum Corporation

DATE	EVENT
1973	The 002 and 004 interceptor basins were constructed.
May 1974	Permit approved to burn oil in the industrial boilers.
July 1975	First complete potline (two potrooms) on the dry scrubber system.
1976	Pumping of groundwater was initiated from the blocking well system to control groundwater flow beneath the facility.
1976	The 001 interceptor basin was constructed.
1977	Oil Recovery Ponds 1 and 2 were enlarged. Permanent underground sprayfield piping and seven monitoring wells (A through G) were installed in the Sprayfield.
September 1977	All four potlines were on the dry scrubber system.
1978	Induction furnace and DC-9 (the last direct chill caster) on line in the Cast House.
1979	Pot Soaking Pits were filled in and covered with asphalt.
1979	Potliner Pile was covered with an asphaltic mixture.
January 1979	Barge unloading was operational.
May 1979	Building 65 (Potliner Breakout) operational for stripping decks, dumping pots, and salvaging bars, brackets, and alkaline ore from spent pots.
1980	Final addition to Potliner Pile.
August 1980	Began installation of microprocessor control systems on each pot.
December 1980	All pots constructed from this month on are prebaked cathode block pots.
December 1980	Microprocessor control system installation completed on one of four potlines.
April 1981	Eleven monitoring wells (DM-series) installed to monitor Areas of Former Potliner Management.
November 1981	Reduction Plant was shut down (until August 1983).
1982	An EPDM cover was added to the Potliner Pile.
February 1983	Four monitoring wells (WP-series) installed around the Oil Recovery Ponds.
1984	Two monitoring wells (LF-1 and LF-2) installed in the Industrial Landfill area.
1984	Building 66 (Potliner Accumulation) was expanded (doubled in floor area).

TABLE 2-1
LIST OF SIGNIFICANT HISTORICAL EVENTS
Ravenswood Aluminum Corporation

DATE	EVENT
1985	KACC eliminated use of leaded gear lubricants on the hotline rolling mills and submitted to DNR a RCRA interim status closure plan for the Oil Recovery System.
April 1987	Four monitoring wells (MW-Series) installed around the Industrial Landfill.
September 1987	Five monitoring wells (IT-series) were installed near the Oil Recovery Ponds.
1988	Rotary barrel furnaces shut down.
1988	The Oil Recovery System and associated piping and equipment were cleaned out and closed under interim status. New double-lined ponds were constructed in the excavations remaining after the interim status closure of Ponds 1 and 2. Pond 3 was cleaned out and backfilled.
July 1988	Eight monitoring wells (K-100 series) installed in the Sprayfield area.
February 1989	Sale of facility to RAC (except for KACC Potliner Pile and Potliner Vault) was final.
April 1989	Seventeen monitoring wells were installed in the Sprayfield Area (nine K-200 series) and the Oil Recovery Pond area (eight GM-series).
1989	The potliner vault was completed.
1990	Blocking well F-10 installed to replace well F-3.
1991	Dross chiller installed.
September 1991	Railcar Loadout Building for spent potliner shipment was completed.
October 1991	A recovery well (RW-1) was installed at the Oil Recovery Ponds.
November 1992	On-site Industrial Landfill closed and on-site solid waste handling station was operational for loading trucks to transport off-site to a solid waste landfill.
March 1993	On-site waste dust handling station was operational for loading trucks to transport off-site.
May 1994	Five monitoring wells (LF-3 through LF-7) were installed around the Industrial Landfill.

TABLE 2-2
REVIEW OF WASTE GENERATION AND MANAGEMENT
Ravenswood Aluminum Corporation

REDUCTION PLANT				
PLANT AREA [end product]	**RAW MATERIALS**	**WASTES GENERATED**	**KNOWN PAST MANAGEMENT**	**CURRENT MANAGEMENT**
CARBON PLANT [rodded anode assemblies]	Delayed Coke, Fluid Coke, Liquid and Solid Pitch, Recycled Carbon, LCOR Solvent	Scrap Anodes, Baghouse Dust, and Carbon Dust	Recycled On-Site, or On-Site Landfill (1)	Recycled On-Site, or Off-Site Solid Waste Landfill
	Refractory Brick, and Concrete	Waste Brick, and Debris	On-Site Landfill (1), or Fill	Off-Site Solid Waste Landfill (Flue Brick use On-Site As Roadbase)
	Rods, Gussets, and Thimbles	Scrap	Scrap Recycler, or Materials Exchange	Scrap Recycler, or Materials Exchange
	Pig Iron, and Alloying Metals	Arc Furnace Dross, Baghouse Dust	On-Site Landfill (1)	Off-Site Solid Waste Landfill
POTROOMS AND SCRUBBERS [molten prime aluminum]	Rodded Anodes	Butts and Burnoffs	Recycled On-Site, or On-Site Landfill (1)	Recycled On-Site, or Off-Site Solid Waste Landfill
	Virgin Alumina and Scrubber Alumina, Scrubber Bags and Filters	Wet or Contaminated Alumina, Scrubber Bags and Filters	On-Site Landfill (1)	Off-Site Solid Waste Landfill
	Cryolite Bath and Fluoride	Gaseous Fluoride	Air Emissions	Captured in Scrubber and Recycled into Pots
		Spent Bath and Dust	Recycled	Recycled, Sold, or Off-Site Solid Waste Landfill
		Particulate Fluoride	Air Emissions	Landfilled with Scrubber Bags and Filters
POT REPAIR [rebuilt pots]	Cathode Paste (old monolithic pots), Insulator Brick, Prebake Cathodes,Collector Bars, Cold Paste (Coal, Liquid Pitch), Silica-Carbide Brick	Collector Bars	Scrap Recycler	Scrap Recycler
		Spent Potliner and Brick	Shipment Off-Site or and Brick On-Site Accumulation	Off-Site Hazardous Waste Landfill, or Off-Site Thermal Treatment
CAST HOUSE [ingots of various aluminum alloys]	Prime Aluminum, Scrap Aluminum, Alloying Metals, Chlorine Gas, Dry Fluxes, Mineral Fibers	Induction Furnace and Dross Chiller Baghouse Dusts	On-Site Landfill (1) (No Dross Chiller Baghouse Dust)	Off-Site Solid Waste Landfills
		Furnace Dross	Off-Site Dross Recycler, or On-Site Landfill (1)	Off-Site Dross Recycler Recovers Free Metal (returned to Cast House), Residuals to Solid Waste Landfill
RECTIFIER STATION [electric power]	Electric Power, Transformer Oil	Non-PCB Waste Oil	Oil Recycler	Oil Recycler
		Waste Oil With PCBs	Off-Site Disposal as Appropriate for PCB Content	Off-Site Disposal as Appropriate for PCB Content

TABLE 2-2 (continued)
REVIEW OF WASTE GENERATION AND MANAGEMENT
Ravenswood Aluminum Corporation

FABRICATION PLANT				
PLANT AREA [end product]	**RAW MATERIALS**	**WASTES GENERATED**	**KNOWN PAST MANAGEMENT**	**CURRENT MANAGEMENT**
SCALPING [scalped ingots]	Aluminum Ingots	Scalped Aluminum Scrap	Recycled to Cast House	Recycled to Cast House
HOTLINE [rolled aluminum plates and coils]	Scalped Ingots	Trimmed and Sheared Aluminum Scrap	Recycled to Cast House	Recycled to Cast House
	Groundwater [Deminerlizer Process]	Deminerlizer Filter Resins	On-Site Landfill (1)	Off-Site Solid Waste Landfill
		Regeneration Wastewater	Neutralized in a Tank and Discharged from NPDES Outfall (after 1975)	Neutralized in a Tank and Discharged from NPDES Outfall
	Hotline Coolant (95% demineralized water and 5% oil emulsion)	Waste Coolant	Acid Break Process (pre-1971) Oil Recovery Ponds (after 1971)	Oil Recovery Ponds
		Filtered Solids and Sludges	Off-Site Solid Waste Landfill	Off-Site Solid Waste Landfill
PLATE BAYS [aluminum sheet and plate]	Rolled Aluminum	Trimmed and Sheared Aluminum Scrap	Recycled to Cast House	Recycled to Cast House
COLD MILLS [finished guage aluminum coils]	Aluminum Coils	Aluminum Scrap	Recycled to Cast House	Recycled to Cast House
	Coolant (Norpar 15)	Waste Coolant Diatomaceous Earth Spent Filter Material	Recycled On-Site On-Site Landfill (1)	Recycled On-Site Off-Site Solid Waste Landfill
	Hydraulic Fluids	Used Hydraulic Fluids	Recycled On-Site	Recycled On-Site
FINISHING [finished sheet, plate and coil]	Aluminum Coil, Sheet and Plate	Trimmed and Sheared Aluminum Scrap	Recycled to Cast House	Recycled to Cast House
	Coolant/Lubricant (KB-39-AA)	Waste Coolant/Lubricant	Recycled On-Site	Recycled and Reused On-Site
	Post Lube (on canstock)	Drippings Into Sumps	Recycled Off-Site	Recycled Off-Site
	APO2 (for distributors)	None	None	None
	Hydraulic Fluids	Used Hydraulic Fluids	Recycled On-Site	Recycled On-Site

TABLE 2-2 (continued)
REVIEW OF WASTE GENERATION AND MANAGEMENT
Ravenswood Aluminum Corporation

BOTH FABRICATION AND REDUCTION PLANTS				
PLANT AREA [end product]	**RAW MATERIALS**	**WASTES GENERATED**	**KNOWN PAST MANAGEMENT**	**CURRENT MANAGEMENT**
MAINTENANCE AND MACHINE SHOPS [maintenance and repairs]	Motor Oils and Hydraulic Oils	Used Motor Oils and Hydraulic Oils	Fuel for Industrial Boiler (after 1974)	Fuel for Industrial Boiler
	Greases	Waste Grease and Oily Wastes	Shipped Off-Site for Solidification and Landfilling (after 1992)	Shipped Off-Site for Solidification and Landfilling
	New Parts and Materials; Welding Rods	Scrap Iron, Steel and Wire; Welding Rodstubs	Recycled, or Off-Site Landfill (1)	Scrap Recycler
	Parts Cleaners	Used Mineral Spirits	Off-Site Recycler	Off-Site Energy Recovery
FABRICATION AND REDUCTION LABORATORIES [quality control analyses of raw materials and products]	Samples, Reagents, Glassware, etc.	Off-Specification and Spent Chemicals	Manifested Off-Site as Hazardous Waste(after 1989)	Manifested Off-Site as Hazardous Waste Lab Packs(if appropriate)
			Neutralized and Discharged (2) through NPDES Outfall	Neutralized and Discharged (2) through NPDES-Permitted Outfall
		Sample Residues	On-Site Landfill (1)	Off-Site Solid Waste Landfill
		Broken Glassware and Equipment	On-Site Landfill (1)	Off-Site Solid Waste Landfill
VARIOUS PLANT AREAS	Supplies, Tools, Parts, Paper, Shipping and Packing Materials, etc.	General Solid Wastes: (including those items listed in Note 4)	On-Site Landfill (1)	Recycling (where feasible), or Off-Site Solid Waste Landfill
	Paints, Solvents, Mineral Spirits	Waste Paints, Solvents, and Mineral Spirits	Manifested Off-Site as Hazardous Waste (after 1989)	Manifested Off-Site as Hazardous Waste

NOTES:
1 The On-Site Landfill was closed in November 1992.
2 Inorganics and acids/bases
3 Organics (no chlorinated organics).
4. Plastic, brake tools, construction/demolition waste, pallets, cardboard, paper glass, lunch waste, debris, miscellaneous trash, respirator cartridges, gloves, mud buckets, Tyvec suits, oily rags, air and oil filters, clutch plates, tires, brake shoes, spark plugs, etc.

TABLE 2-3
PCB-CONTAMINATED TRANSFORMERS

UNIT NUMBER	SERIAL NUMBER	LOCATION IN PLANT	KVA SIZE	GALLONS OF OIL	PCB LEVEL
1	C502623	Auxiliary	750	480	051
2	C502624	Auxiliary	750	480	077
CE1611	C504061	Bake Carbon Exhaust Fan	500	300	135
CE1621	C5044063	Bake Carbon SW Side	500	300	137
CE2211	C504492	Boiler House	5000	1539	068
CE2212	C504493	Boiler House	5000	1539	077
CE2213	SEV418001	Boiler House	5000	524	117
CE2221	C504065	Boiler House	500	300	134
CE2222	C5044069	Boiler House	500	300	060
CE2223	C504068	Boiler House	500	300	092
1	C504071	Crane Power	500	300	075
2	C504070	Crane Power	500	300	061
SP	C504067	Crane Power	500	300	130
CE1211	C504482	Green Carbon	2000	738	108
CE1212	C5044483	Green Carbon	2000	738	087
CE1011	C504072	Laboratory Sub	500	300	079
CE1411	C504073	Machine Shop	500	300	084
CE1412	C504066	Machine Shop	500	300	096
25	C587472	Phase Shifter	10300	950	064
CE2011	C504062	Rodding Equipment	500	300	137
CE2012	C504074	Rodding Equipment	500	300	144
--	C374133	#7 Pump House	1000	425	50

TABLE 2-4
INFLUENT SOURCES TO OIL RECOVERY SYSTEM

SOURCE
Hot Mill Sumps [A]
Belt Skimmer Washwater
Coolant Dumps/Mill Clean
Centrifuge
Cold Roll
Leaks & Misc. Sources
Oil Reclamation Building
Jet Vac/Eqpt. Washing/Oil Dumps
Fabrication Pump House Sump
Casting Basin
Interceptor Basin
Rainfall/Runoff

[A] Indented line items comprise Hot Mill Sump contribution.

TABLE 2-5
SUMMARY OF REVISIONS TO PART A PERMIT APPLICATIONS

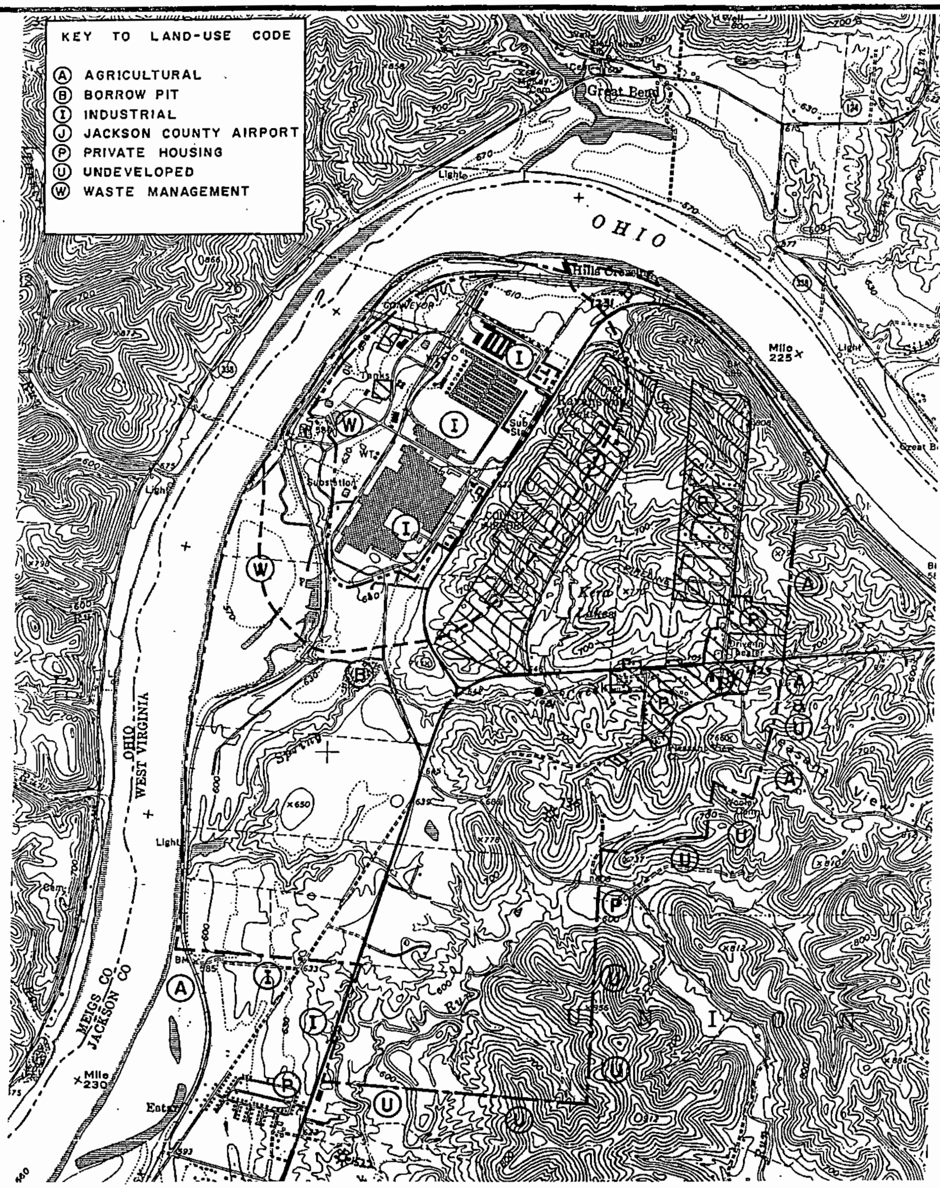
UNIT NO.	PROCESS CODE AND DESCRIPTION	PROCESS NAME	HAZARDOUS WASTE CODE	CAPACITY IN 1980 APPLICATION	1982 REVISIONS	1988 REVISIONS	1989 REVISIONS	1991 REVISIONS	1994 REVISIONS
1	S02 -Storage in tanks	Boilerhouse Oil Storage	D008	15,000 gallons			Units being closed - D008 waste no longer managed		
2	S02 - Storage in tanks	Tank No. 1	D008	600,000 gallons			Units being closed - D008 waste no longer managed		
3	S02 - Storage in tanks	Works Tank Farm	D008	200,000 gallons		Added 2 500,000 tanks	Units being closed - D008 waste no longer managed		
4	S03 - Storage in waste piles	Spent Potlining Pile	K088	81,620 cubic yards	Deleted - K088 no longer listed				
5	S03 - Storage in waste piles	Pot Repair Potlining Storage	K088	11,852 cubic yards	Deleted - K088 no longer listed				

TABLE 2-5 (continued)
SUMMARY OF REVISIONS TO PART A PERMIT APPLICATIONS

UNIT NO.	PROCESS CODE AND DESCRIPTION	PROCESS NAME	HAZARDOUS WASTE CODE	CAPACITY IN 1980 APPLICATION	1982 REVISIONS	1988 REVISIONS	1989 REVISIONS	1991 REVISIONS	1994 REVISIONS
6	S03 - Storage in waste piles	Hazardous Waste Storage	None	14,815 cubic yards	Deleted - no hazardous waste stored in process				
7	S04 - Storage in surface impoundment	Oil Pond #1	D008	1,500,000 gallons	Changed process code to T02 - treatment in surface impoundment		Units undergoing closure - D008 waste no longer managed		Added - for management of used oil per 40 CFR 279.12(a)
8	S04 - Storage in surface impoundment	Oil Pond #2	D008	2,500,000 gallons	Ditto above		Units undergoing closure - D008 waste no longer managed		Ditto above
9	S04 - Storage in surface impoundment	Oil Pond #3	D008	1,000,000 gallons	Changed process code to T02 - treatment in surface impoundment		Units being closed - D008 waste no longer managed		

TABLE 2-5 (continued)
SUMMARY OF REVISIONS TO PART A PERMIT APPLICATIONS

UNIT NO.	PROCESS CODE AND DESCRIPTION	PROCESS NAME	HAZARDOUS WASTE CODE	CAPACITY IN 1980 APPLICATION	1982 REVISIONS	1988 REVISIONS	1989 REVISIONS	1991 REVISIONS	1994 REVISIONS
10	S04 - Storage in surface impoundment	Tank No. 1 Basin	D008	600,000 gallons			Units being closed - D008 waste no longer managed		
11	S01 - Storage in containers	Siphon Cleaning System	D002	500 gallons	Deleted - elementary neutralization				
12	S02 - Storage in tanks	Horiz. Heat Treat Quench System	F012	48,300 gallons	Deleted - no hazardous waste stored in process				
13	T01 - Treatment in tanks	Hotline Neutraliza-tion Tank	D002	40,000 gallons per day	Deleted - elementary neutralization				
Other					Added F002 - 0.035 tons/ year storage in tanks	Deleted F002	Ownership changed from KACC to RAC	D008 code added for oil on water table near ponds	



1960
PHOTOREVISED 1987
DMA 4661 IV NE-SERIES V854

SCALE

0 2000 Feet

CONTOUR INTERVAL 20 FEET

LEGEND

(R) LAND-USE CODE (SEE KEY)

PROPERTY NOT OWNED BY RAVENSWOOD ALUMINUM CORPORATION

RAC PROPERTY BOUNDARY

INDUSTRIAL PLANT FENCE LINE

1/4 MILE DISTANCE FROM PLANT FENCE

(Source: Ravenswood, W. VA.-OHIO 7.5' U.S.G.S. Quadrangle)

NOTE:
THIS MAP WAS PREPARED BY GERAGHTY & MILLER, INC.
DATED 1/15/91

QUADRANGLE LOCATION

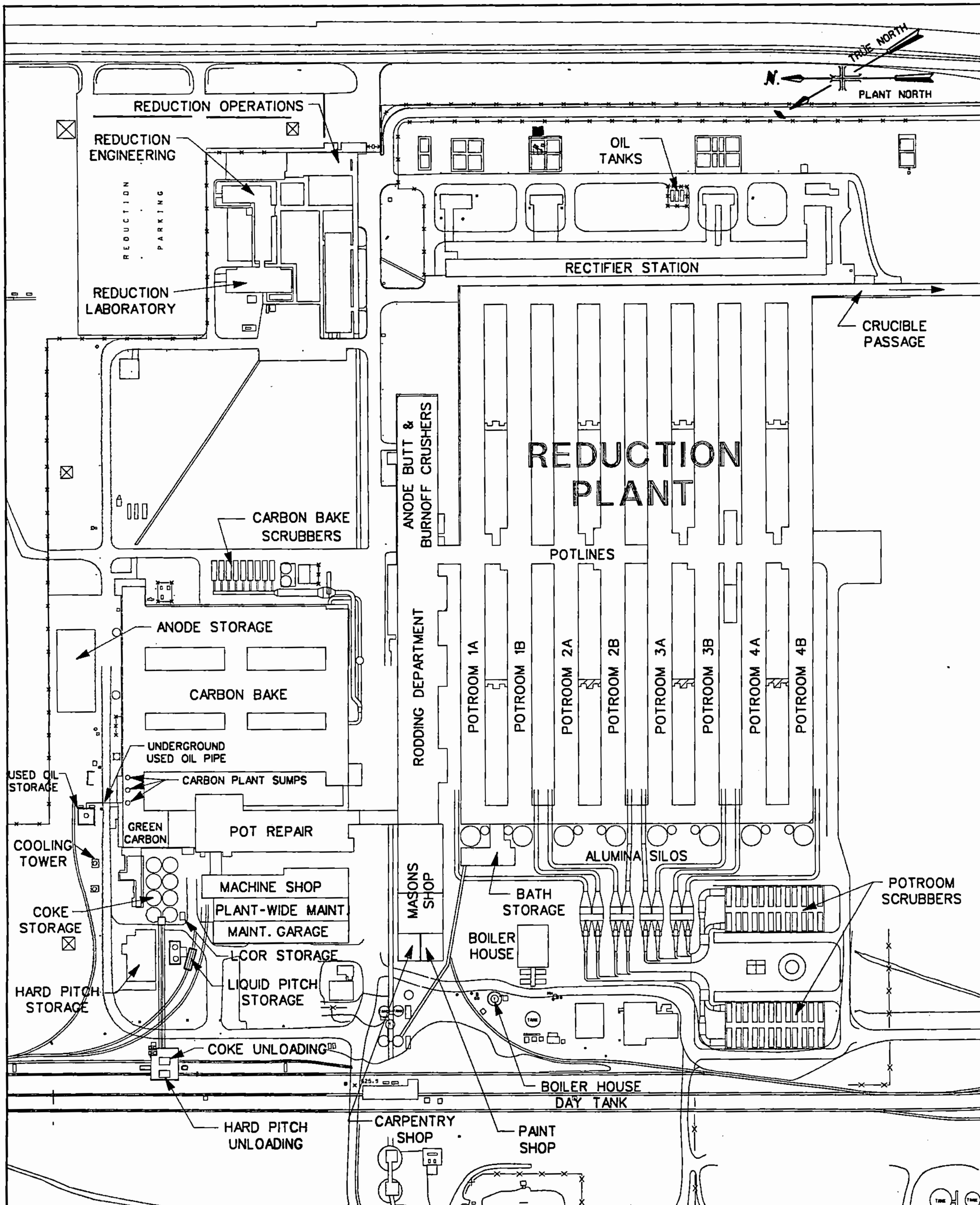
FIGURE 2-1

LAND USE SURROUNDING FACILITY

RAVENSWOOD ALUMINUM
RAVENSWOOD, WV

RMT INC. 70410.21
0296

THE PRINT MACHINE, INC. N03478



0 300
SCALE IN FEET

FIGURE 2-2A

PLAN VIEW
MANUFACTURING FACILITY

RMT INC.
70410.07
0396

RAVENSWOOD ALUMINUM CORPORATION
RAVENSWOOD, WV

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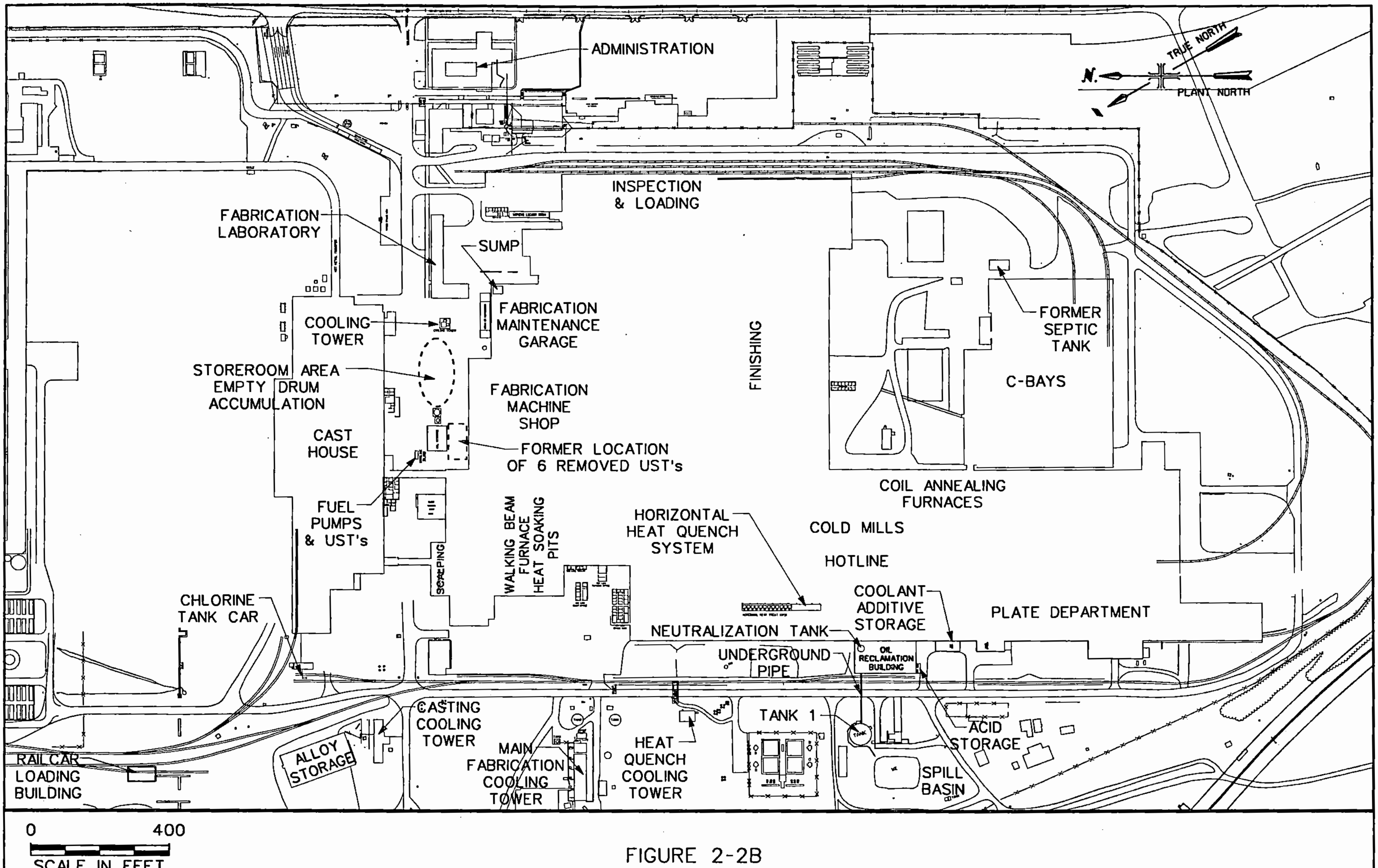

FIGURE 2-2B

PLAN VIEW
MANUFACTURING FACILITY

RMT
70410.07
0496

RAVENSWOOD ALUMINUM CORPORATION
RAVENSWOOD, WV

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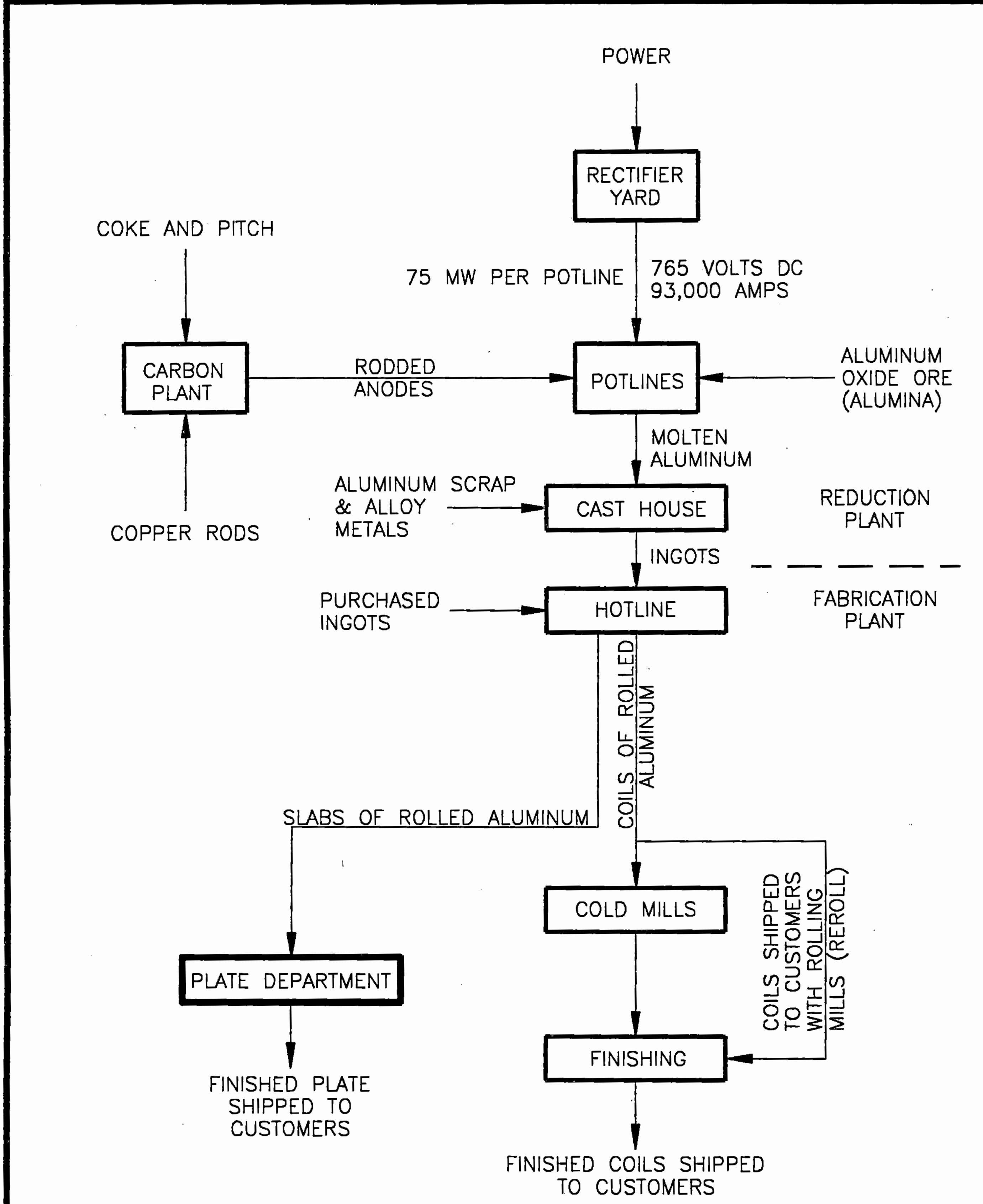

FIGURE 2-3

BLOCK DIAGRAM OF ALUMINUM MANUFACTURING PROCESS

RMT 70410.21
0296

RAVENSWOOD ALUMINUM
RAVENSWOOD, WV

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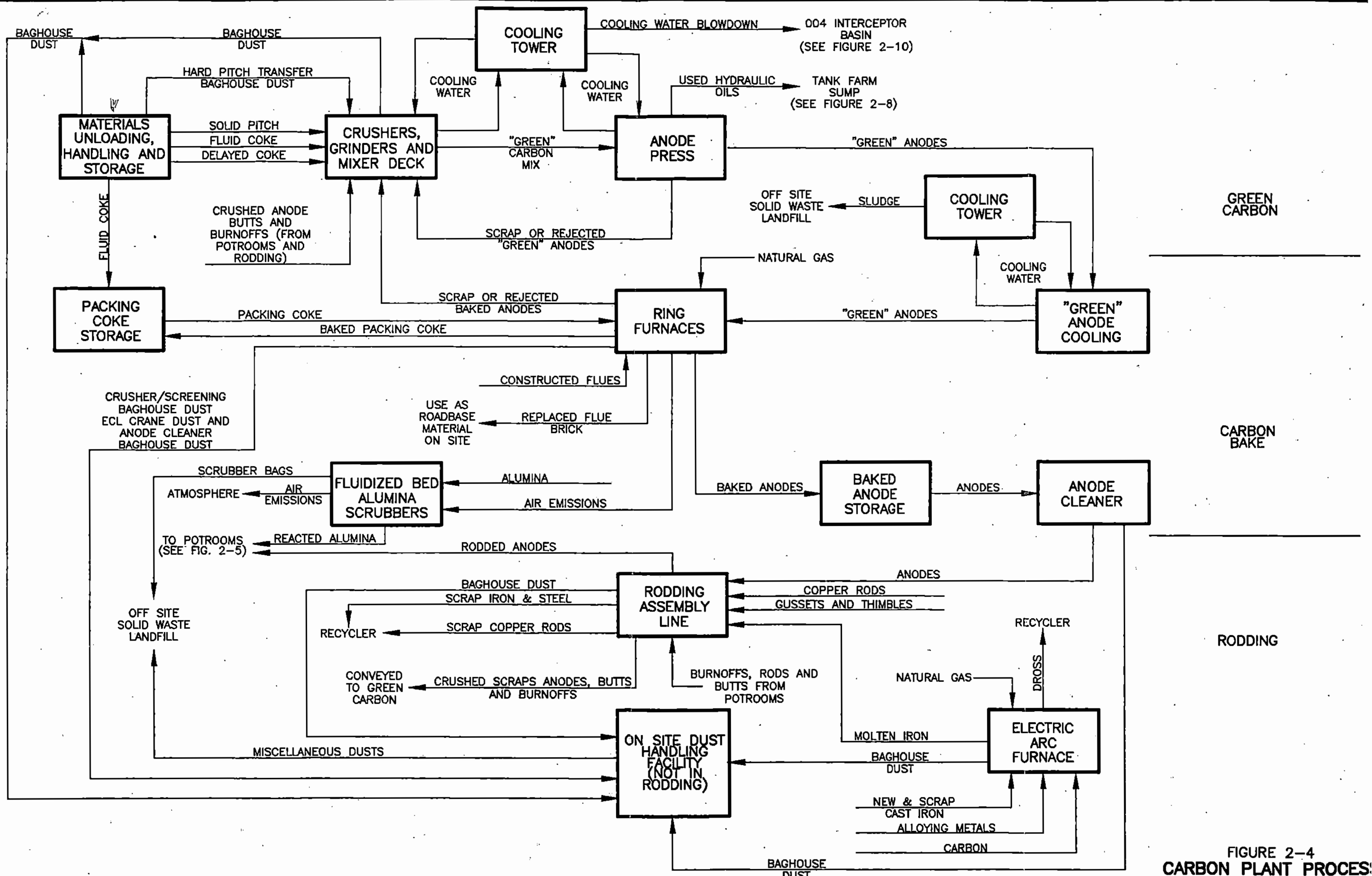

RMT 70410.21 0296

FIGURE 2-4
CARBON PLANT PROCESS
RAVENSWOOD ALUMINUM
RAVENSWOOD, WV

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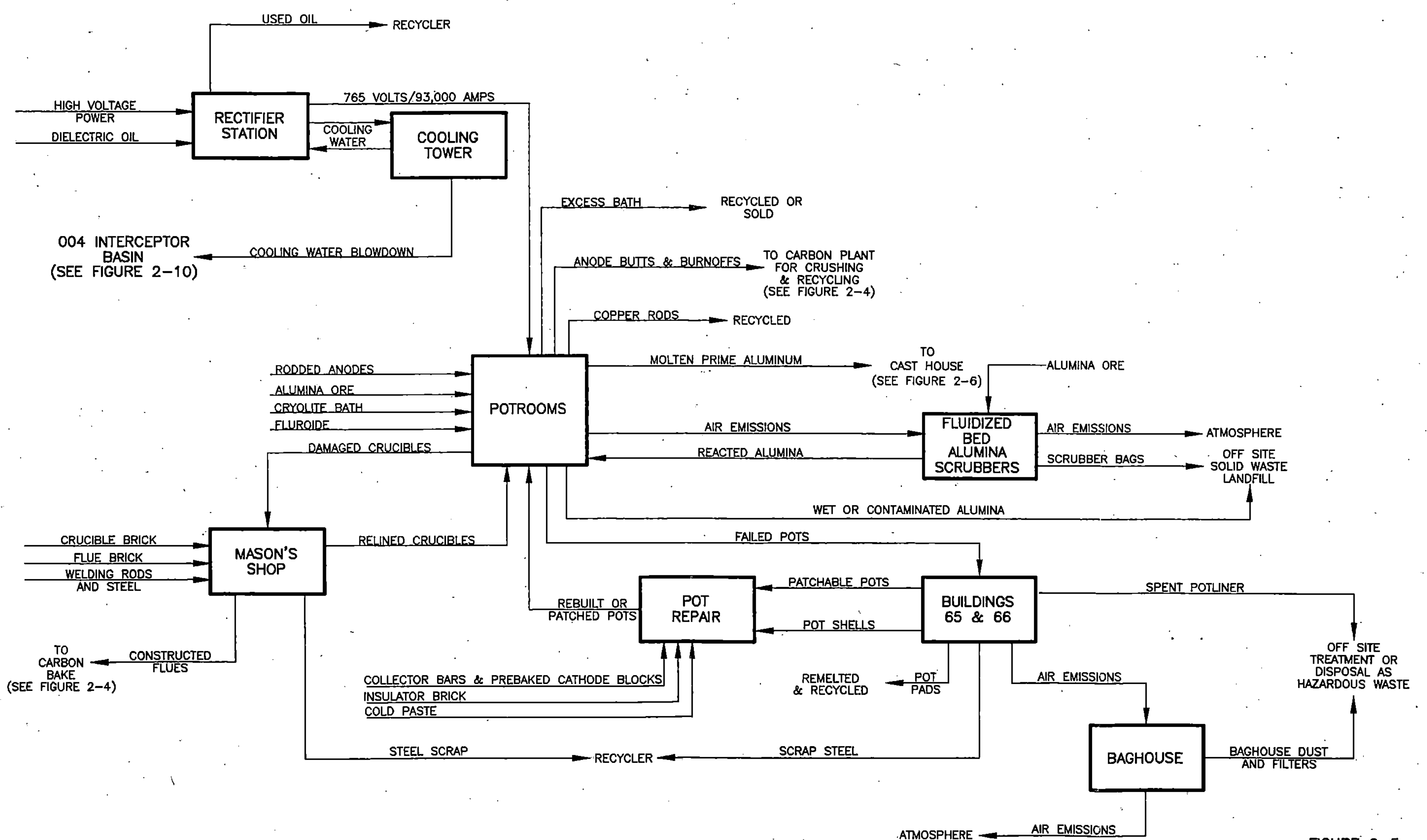

RMT 70410.21
0296

FIGURE 2-5
POTROOM PROCESSES
RAVENSWOOD ALUMINUM
RAVENSWOOD, WV

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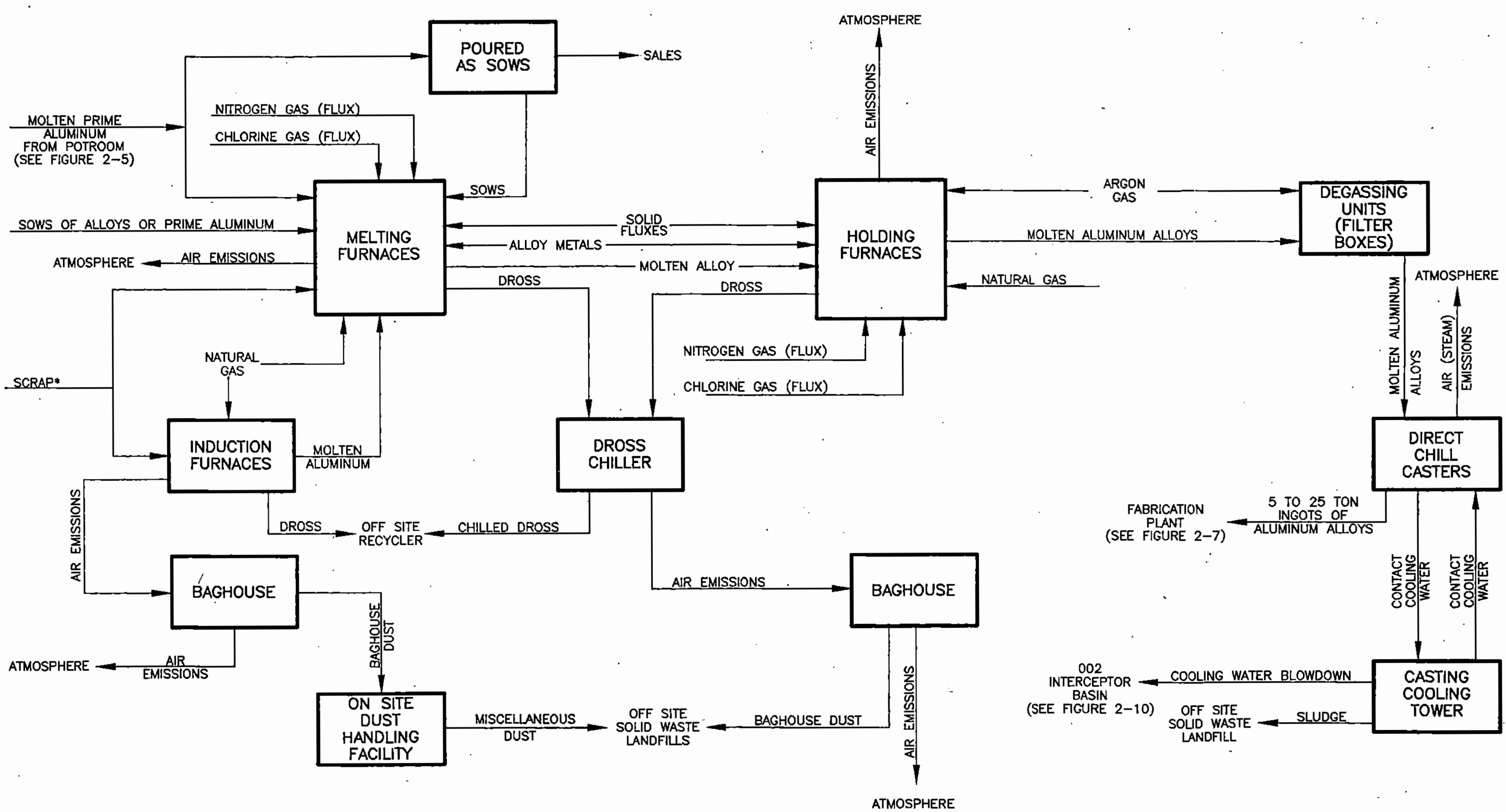

*SCRAP CAN INCLUDE:
BILLETS, INGOTS, SOWS, TRIMMINGS, SPLATTERS, CLASS 1 CAN SCRAP, SCALPER CHIPS, SIDE TRIMMINGS, DECANT, ETC.

70410.21
0296

FIGURE 2-6
CAST HOUSE PROCESSES
RAVENSWOOD ALUMINUM
RAVENSWOOD, WV

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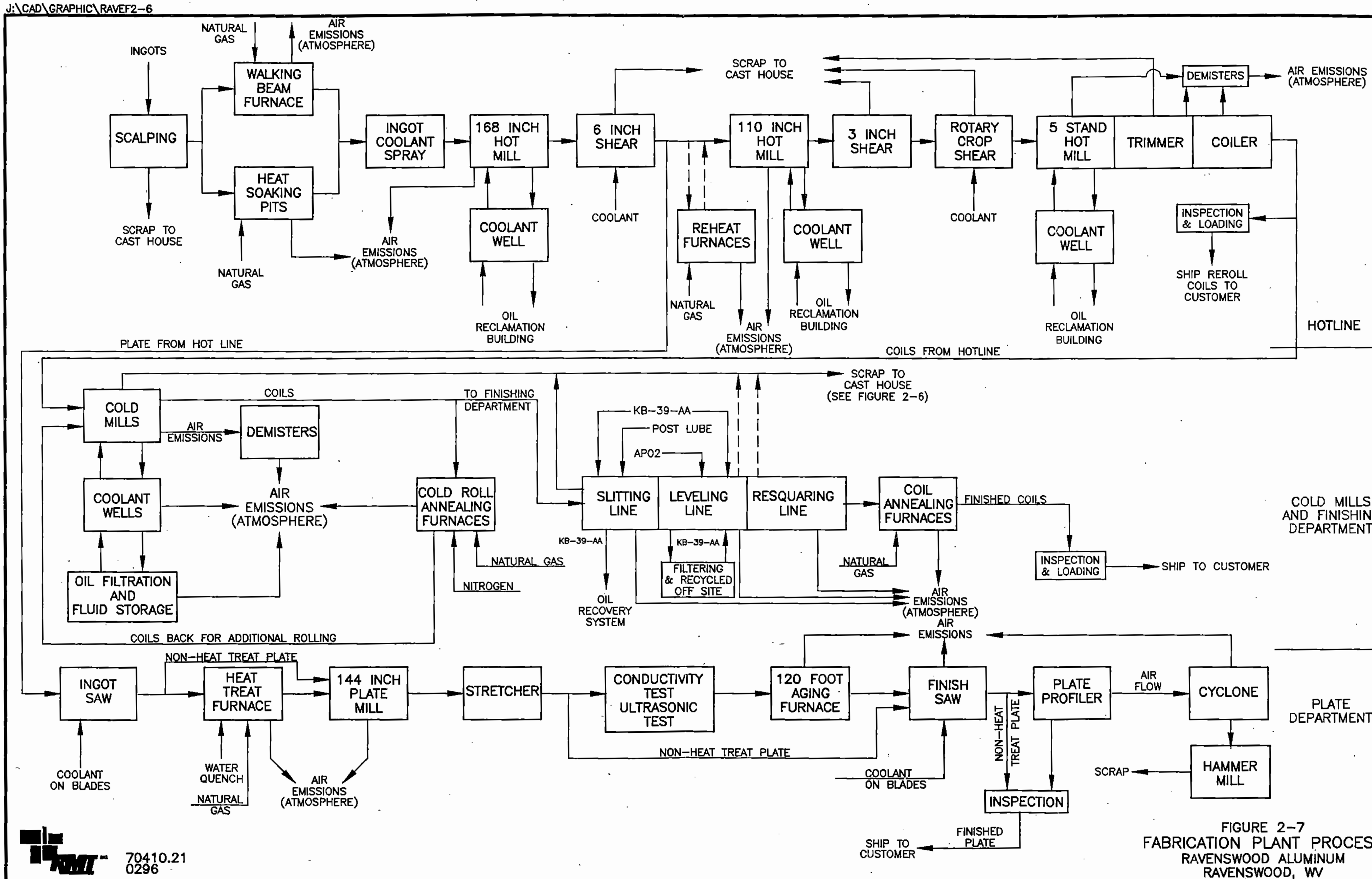

70410.21
0296

FIGURE 2-7
FABRICATION PLANT PROCESS
RAVENSWOOD ALUMINUM
RAVENSWOOD, WV

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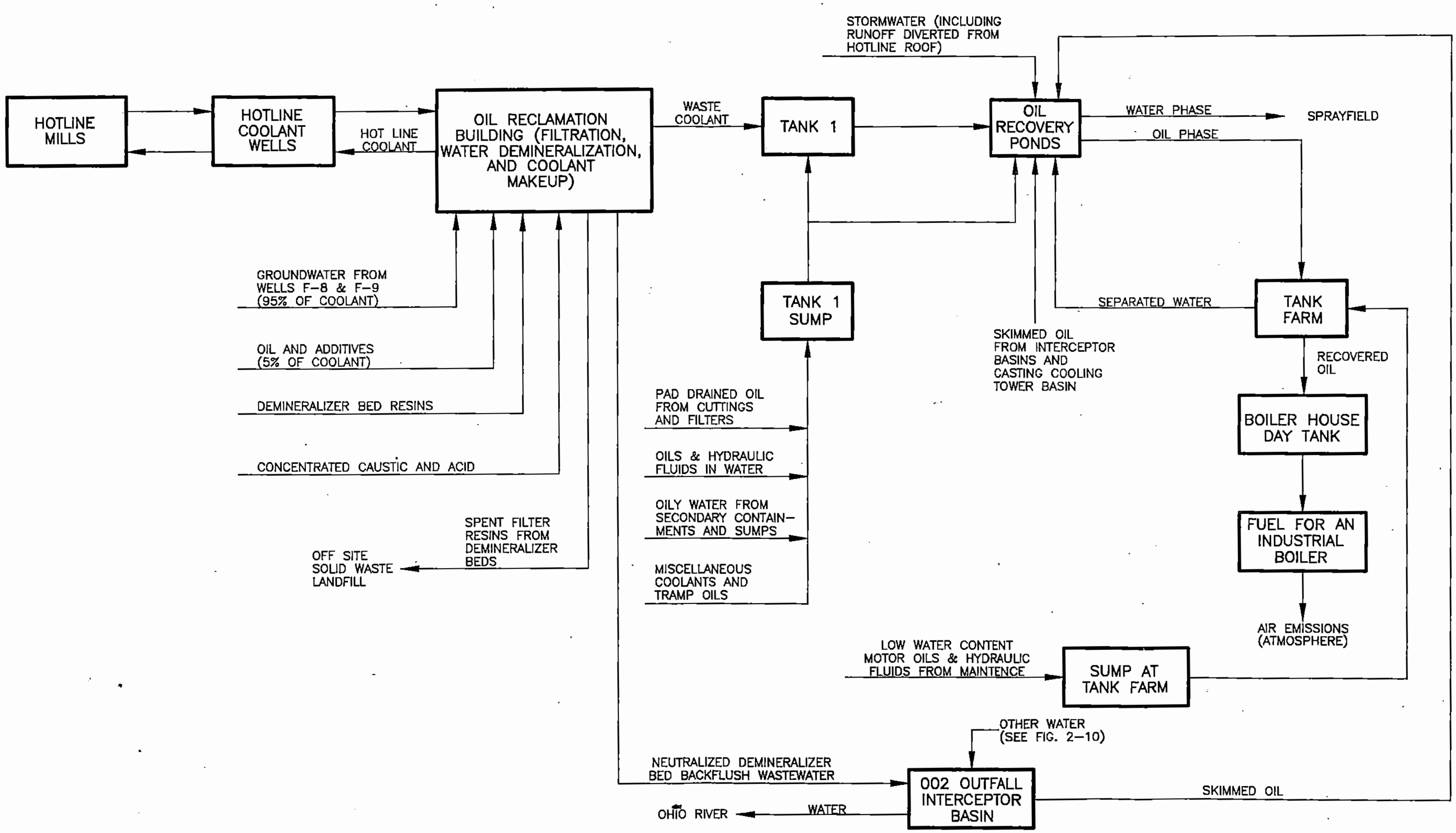
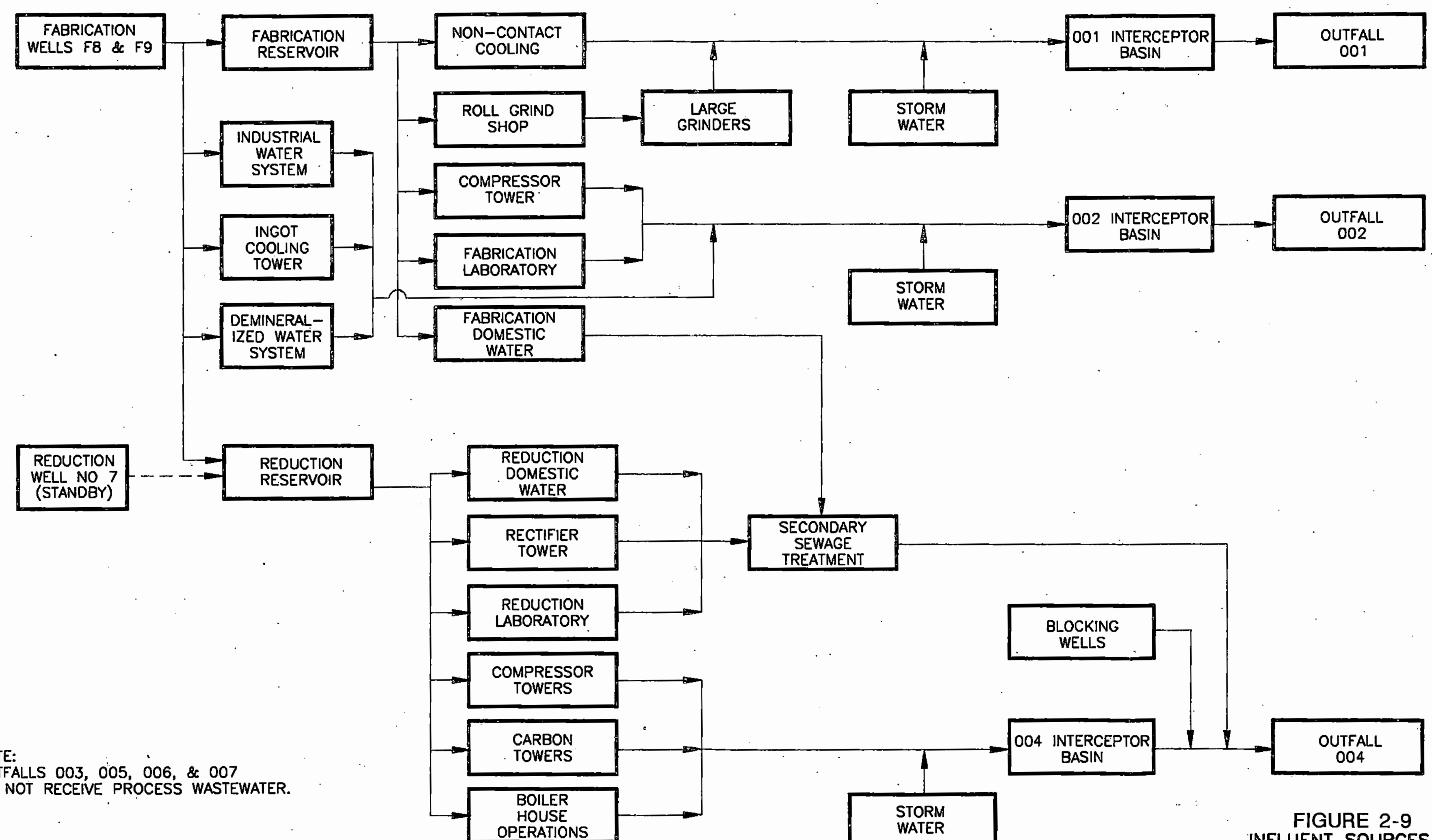


RMT 70410.21
0296

FIGURE 2-8
OIL RECOVERY SYSTEM
RAVENSWOOD ALUMINUM
RAVENSWOOD, WV



NOTE:
OUTFALLS 003, 005, 006, & 007
DO NOT RECEIVE PROCESS WASTEWATER.

RMT 70410.21
0296

FIGURE 2-9
INFLUENT SOURCES TO NPDES OUTFALLS
RAVENSWOOD ALUMINUM
RAVENSWOOD, WV